HISTORY INFORMATION FOR THE FOLLOWING MANUAL:

SERVICE MANUAL

BA-6 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
KV-21FA210	*RM-Y180*	*LATIN NORTH*	*SCC-S60P-A*
KV-21FA210	*RM-Y180*	*LATIN SOUTH*	*SCC-S60Q-A*

ORIGINAL MANUAL ISSUE DATE: 3/2003

ALL REVISIONS AND UPDATES TO THE ORIGINAL MANUAL ARE APPENDED TO THE END OF THE PDF FILE.

REVISION DATE	REVISION TYPE	SUBJECT
3/2003	No revisions or updates are applicable at this time.	
4/2003	Correction -1	Replaced A Board Transistor Voltage List (Q600, Q601) (Page 34) Replaced A Board IC Voltage List (IC600) (Page 35)

TRINITRON® COLOR TELEVISION

SONY®

9-965-938-02

Self Diagnosis Supported model

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KV-21FA210

RM-Y180

TRINITRON® COLOR TELEVISION

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SPECIFICATIONS

	KV-21FA210
Power requirements (Latin North)	120V, 60Hz
Power requirements (Latin South)	220V, 50/60Hz
Number of Inputs/Outputs	
Video [1)]	2
S Video [2)]	1
Y, P_B, P_R [3)]	1
Audio [4)]	2
Speaker output (W)	6 W x 2
External Subwoofer	14W
Headphones [5)]	1
Power Consumption (W)	
In use (Max) (Latin North)	145W
In use (Max) (Latin South)	140W
In Standby	1W
Dimensions(W/H/D)	
mm	609 x 488 x 503 mm
in	24 x 19 1/4 x 20
Mass	
kg	29 kg
lbs	63 lbs. 9 oz.

1) 1 Vp-p 75 ohms unbalanced, sync negative
2) Y: 1 Vp-p 75 ohms unbalanced, sync negative
C: 0.286 Vp-p (Burst signal), 75 ohms
3) Y: 1.0 Vp-p, 75 ohms, sync negative; PB: 0.7 Vp-p, 75 ohms;
PR Vp-p, 75 ohms.
4) 500 mVrms (100% modulation), Impedance: 47 kilohms
5) More than 408 mVrms at the maximum volume setting (variable)
More than 408 mVrms (fix); Impedance (output): 2 kilohms

Television system
American TV Standard, NTSC

Channel coverage
VHF: 2-13/ UHF: 14-69/ CATV: 1-125

Picture tube
FD Trinitron® tube

Visible screen size
20 inch picture measured diagonally

Actual screen size
21 inch measured diagonally

Antenna
75 ohm external terminal for VHF/UHF

Supplied Accessories
Remote Commander:
RM-Y180
Size AA (R6) batteries (2)
Antenna, Telescopic

(●) SRS (SOUND RETRIEVAL SYSTEM)

The (●) SRS (SOUND RETRIEVAL SYSTEM) is manufactured by Sony Corporation under license from SRS Labs, Inc. It is covered by U.S. Patent No. 4,748,669. Other U.S. and foreign patents pending.

The word 'SRS' and the SRS symbol (●) are registered trademarks of SRS Labs, Inc. BBE and BBE symbol are trademarks of BBE Sound, Inc. and are licensed by BBE Sound, Inc. under U.S. Patent No. 4,638,258.

Design and specifications are subject to change without notice.

WARNINGS AND CAUTIONS

CAUTION

Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield, or carbon painted on the CRT, after removing the anode.

WARNING!!

An isolation transformer should be used during any service to avoid possible shock hazard, because of live chassis. The chassis of this receiver is directly connected to the AC power line.

⚠ SAFETY-RELATED COMPONENT WARNING!!

Components identified by shading and ⚠ mark on the schematic diagrams, exploded views, and in the parts list are critical for safe operation. Replace these components with Sony parts whose part numbers appear as shown in this manual or in supplements published by Sony. Circuit adjustments that are critical for safe operation are identified in this manual. Follow these procedures whenever critical components are replaced or improper operation is suspected.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.

2. Check the interboard wiring to ensure that no wires are “pinched” or touching high-wattage resistors.

3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.

4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.

5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.

7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.

8. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

Leakage Test

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instructions.

2. A battery-operated AC milliampmeter. The Data Precision 245 digital multimeter is suitable for this job.

3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson’s 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).

How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms.

If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble- light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

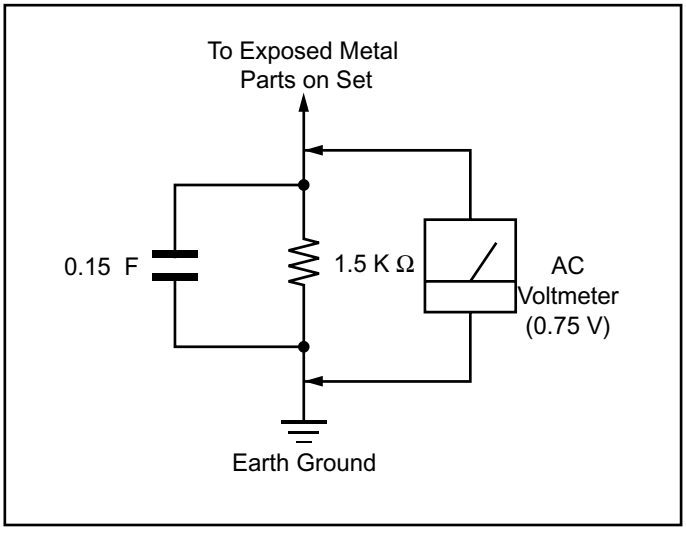


Figure A. Using an AC voltmeter to check AC leakage.

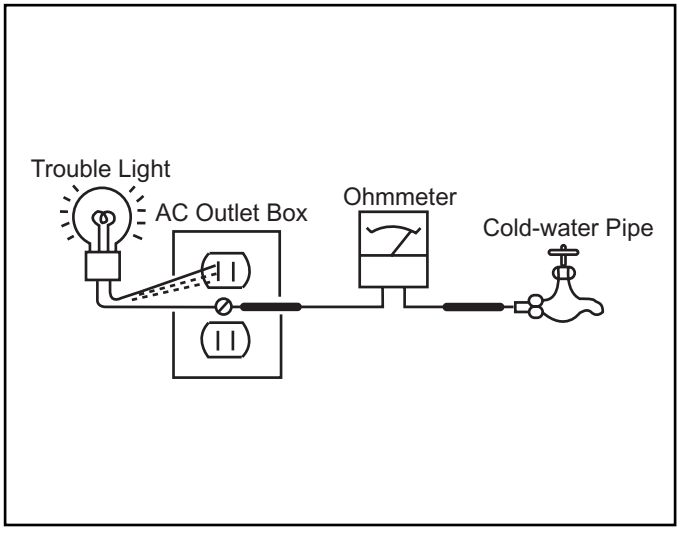


Figure B. Checking for earth ground.

SELF-DIAGNOSTIC FUNCTION

Self Diagnosis Supported model

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER LED flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the Remote Commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

Diagnostic Test Indicators

When an error occurs, the STANDBY/TIMER LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas.

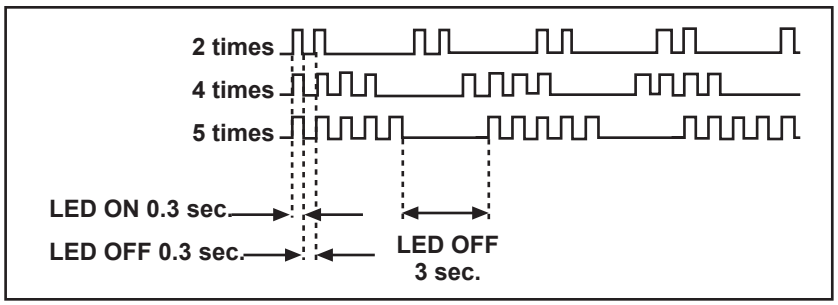
Results for all of the following diagnostic items are displayed on screen. No error has occurred if the screen displays a "0".

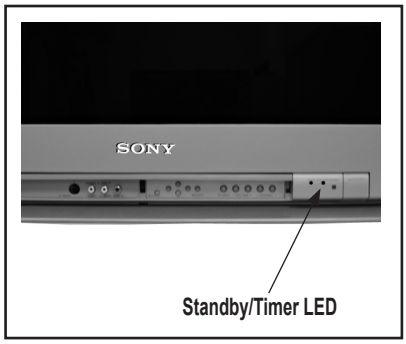
Diagnostic Item Description	No. of times STANDBY/ TIMER lamp flashes	Self-Diagnositc Display/ Diagnostic Result	Probable Cause Location	Detected Symptoms
Power does not turn on	Does not light	————	• Power cord is not plugged in. • Fuse is burned out (F601). (A Board)	• Power does not come on. • No power is supplied to the TV. • AC Power supply is faulty.
+B overcurrent (OCP)*	2 times	2:0 or 2:1	• H.OUT (Q505) is shorted. (A Board) • IC1751 is shorted. (CV Board)	• Power does not come on. • Load on power line is shorted.
I-Prot	4 times	4:0 or 4:1	• +13V is not supplied. (A Board) • IC545 is faulty. (A Board)	• Has entered standby state after horizontal raster. • Vertical deflection pulse is stopped. • Power line is shorted or power supply is stopped.
IK (AKB)	5 times	5:0 or 5:1	• Video OUT (IC545) is faulty. (A Board) • IC001 is faulty. (A Board) • Screen (G2) is improperly adjusted.**	• No raster is generated. • CRT Cathode current detection reference pulse output is small.

*If a +B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously. The symptom that is diagnosed first by the mircrocontroller is displayed on the screen.

**Refer to Screen (G2) Adjustments in Section 2-4. of this manual.

Display of Standby/Timer LED Flash Count





Diagnostic Item	Flash Count*
+B Overcurrent	2 times
I-Prot	4 times
IK (AKB)	5 times

*One flash count is not used for self-diagnostic.

Stopping the Standby/Timer LED Flash

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER LAMP from flashing.

Self-Diagnostic Screen Display

For errors with symptoms such as “power sometimes shuts off” or “screen sometimes goes out” that cannot be confirmed, it is possible to bring up past occurrences of failure on the screen for confirmation.

To Bring Up Screen Test

In standby mode, press buttons on the Remote Commander sequentially, in rapid succession, as shown below:

Display ➡ Channel 5 ➡ Sound Volume - ➡ Power ON

⇧ Note that this differs from entering the Service Mode (Sound Volume +).

Self-Diagnostic Screen Display

SELF DIAGNOSTIC
2: 000
3: N/A
4: 000
5: 001
101: N/A

Numeral “0” means that no fault was detected.
Numeral “1” means a fault was detected one time only.

Handling of Self-Diagnostic Screen Display

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to “0”.
Unless the result display is cleared to “0”, the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

Clearing the Result Display

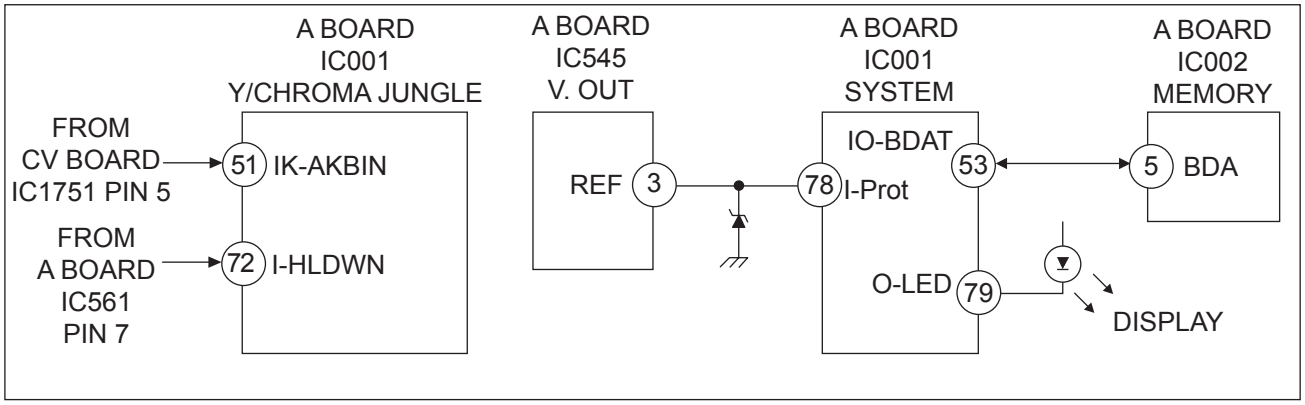
To clear the result display to “0”, press buttons on the Remote Commander sequentially when the diagnostic screen is displayed, as shown below:

Channel 8 ➡ ENTER

Quitting the Self-Diagnostic Screen

To quit the entire self-diagnostic screen, turn off the power switch on the Remote Commander or the main unit.

Self-Diagnostic Circuit



+B overcurrent (OCP)

Occurs when an overcurrent on the +B (135V) line is detected by pin 72 of IC001 (A Board). If the voltage of pin 72 of IC001 (A Board) is less than 1V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.

I-Prot

Occurs when an absence of the vertical deflection pulse is detected by pin 78 of IC001 (A Board). Power supply will shut down when waveform interval exceeds 2 seconds.

IK (AKB)

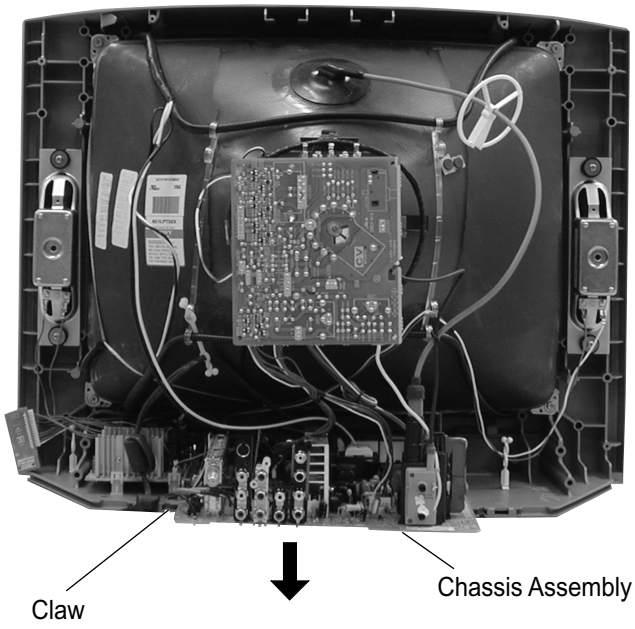
If the RGB levels* do not balance within 2 seconds after the power is turned on, this error will be detected by IC001 (A Board). TV will stay on, but there will be no picture.

*(Refers to the RGB levels of the AKB detection Ref pulse that detects 1K).

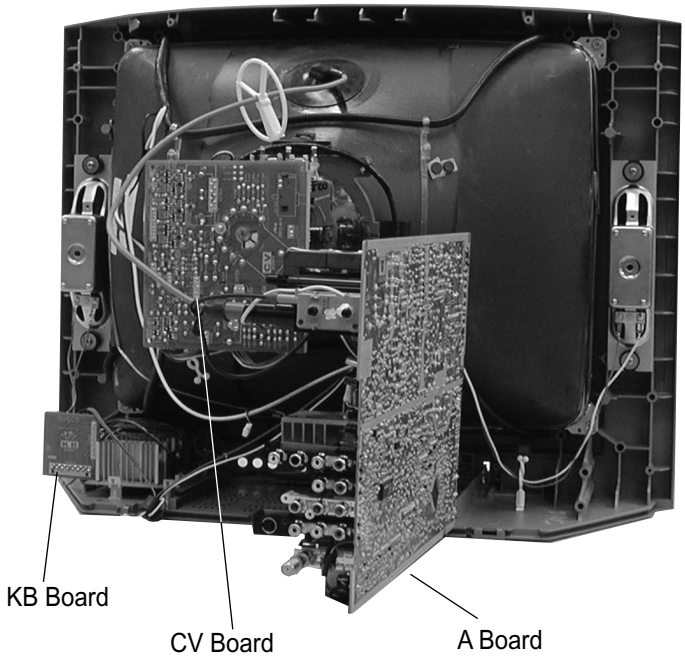
SECTION 1: DISASSEMBLY

1-1. REAR COVER REMOVAL

1-2. CHASSIS ASSEMBLY REMOVAL



1-3. SERVICE POSITION



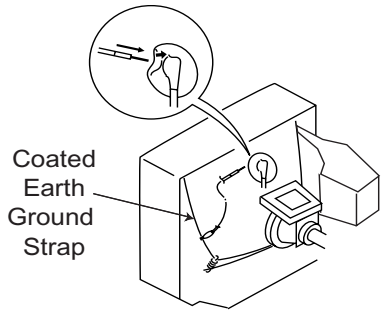
①Unplug KB Board and 2 pin woofer connector and move out of the way.

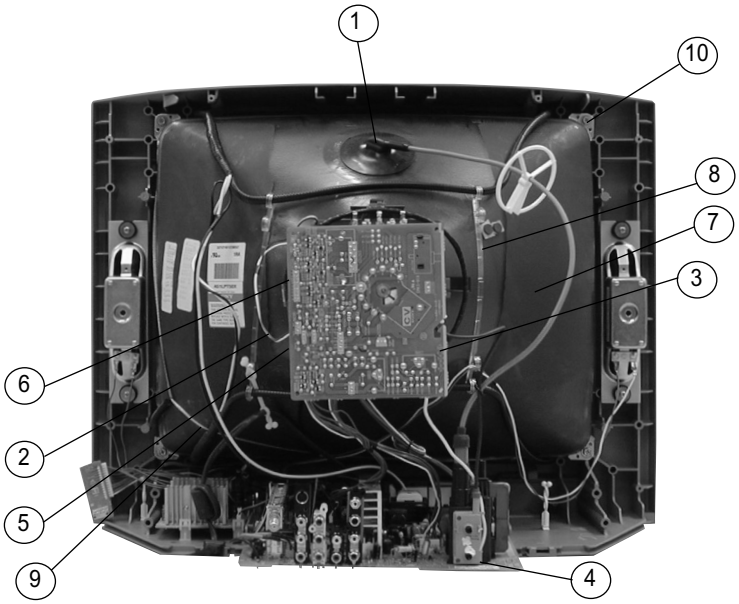
②Press on catch tab to release A Board.

③Disconnect remaining cables to allow A Board to be removed.

1-4. PICTURE TUBE REMOVAL

WARNING: BEFORE REMOVING THE ANODE CAP
High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT before attempting to remove the anode cap. Short between anode and CRT coated earth ground strap.



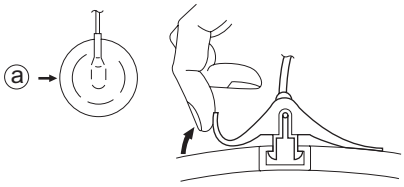


1. Discharge the anode of the CRT and remove the anode cap.
2. Unplug all interconnecting leads from the deflection yoke, neck assembly, degaussing coils and CRT grounding strap.
3. Remove the CV Board from the CRT.
4. Remove the chassis assembly.
5. Loosen the neck assembly fixing screw and remove.
6. Loosen the deflection yoke fixing screw and remove.
7. Place the set with the CRT face down on a cushion and remove the degaussing coil holders.
8. Remove the degaussing coils.
9. Remove the CRT grounding strap and spring tension devices.
10. Unscrew the four CRT fixing screws [located on each CRT corner] and remove the CRT [Take care not to handle the CRT by the neck].

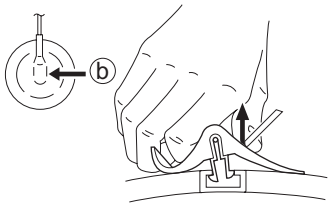
ANODE CAP REMOVAL PROCEDURE

WARNING: High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT **before** attempting to remove the anode cap. Short between anode and coated earth ground strap of CRT.
NOTE: After removing the anode cap, short circuit the anode of the picture tube and the anode cap to either the metal chassis, CRT shield, or carbon painted on the CRT.

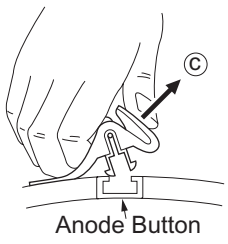
REMOVAL PROCEDURES



Turn up one side of the rubber cap in the direction indicated by arrow ⓐ .



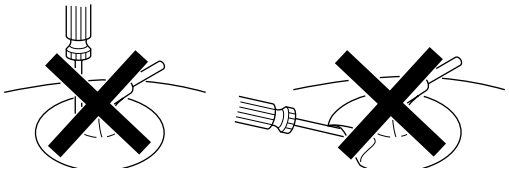
Use your thumb to pull the rubber cap firmly in the direction indicated by arrow ⓑ .



When one side of the rubber cap separates from the anode button, the anode cap can be removed by turning the rubber cap and pulling it in the direction of arrow ⓒ .

HOW TO HANDLE AN ANODE CAP

1. Do not use sharp objects which may cause damage to the surface of the anode cap.
2. To avoid damaging the anode cap, do not squeeze the rubber covering too hard. A material fitting called a shatter-hook terminal is built into the rubber.
3. Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



SECTION 2: SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or a new picture tube is installed.

These adjustments should be performed with rated power supply voltage unless otherwise noted.

Set the controls as follows unless otherwise noted:
VIDEO MODE: Standard
PICTURE CONTROL: Normal
BRIGHTNESS CONTROL: Normal

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2)
5. White Balance

Note Test Equipment Required:

1. Color Bar Pattern Generator
2. Degausser
3. DC Power Supply
4. Digital Multimeter

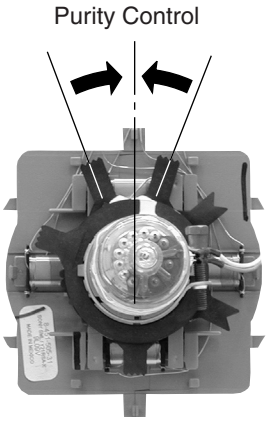
2-1. BEAM LANDING

Before beginning adjustment procedure:

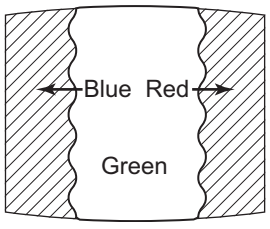
1. Degauss the entire screen.
2. Feed in the white pattern signal.

ADJUSTMENT PROCEDURE

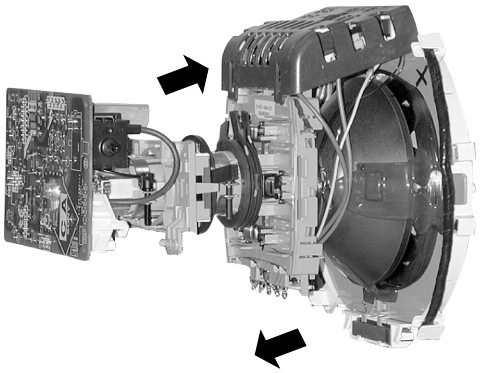
1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw, and set the purity control to the center as shown below:

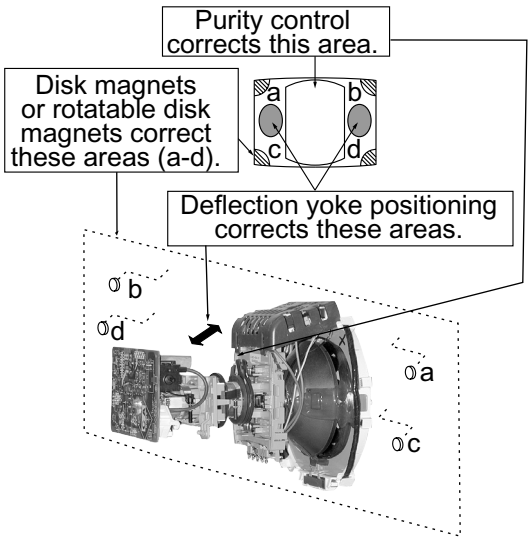


3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward, and adjust with the purity control so that green is in the center and red and blue are even on both sides.



5. Move the deflection yoke forward, and adjust so that the entire screen becomes green.
6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. If landing at the corner is not right, adjust by using the disk magnets.





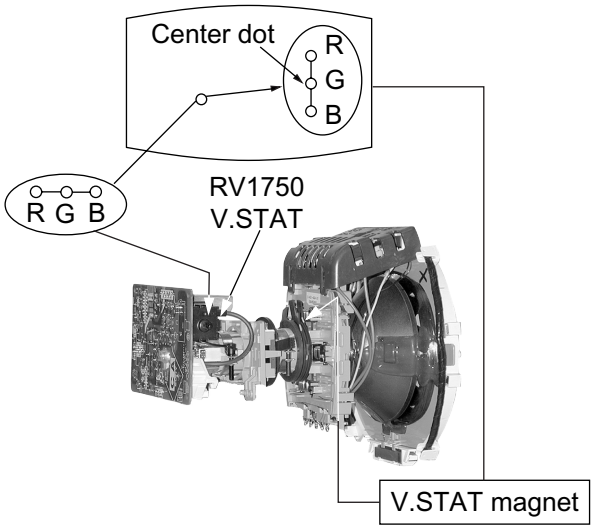
2-2. CONVERGENCE

Before starting convergence adjustments:

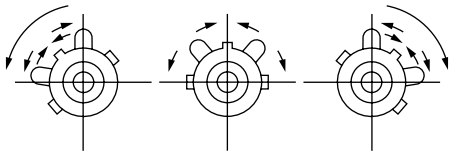
1 Perform FOCUS, VLIN and VSIZE adjustments.
2. Set BRIGHTNESS control to minimum.
3. Feed in dot pattern.

VERTICAL STATIC CONVERGENCE

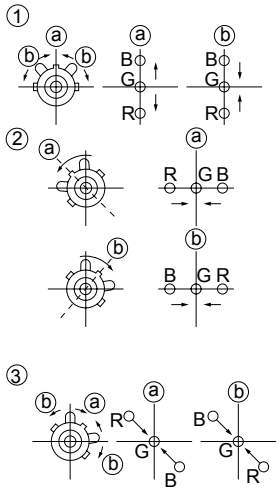
1. Adjust V. STAT magnet to converge red, green and blue dots in the center of the screen (Vertical movement adjust S V.STAT RV1750 to converge).



2. Tilt the V. STAT magnet and adjust static convergence to open or close the V. STAT magnet.



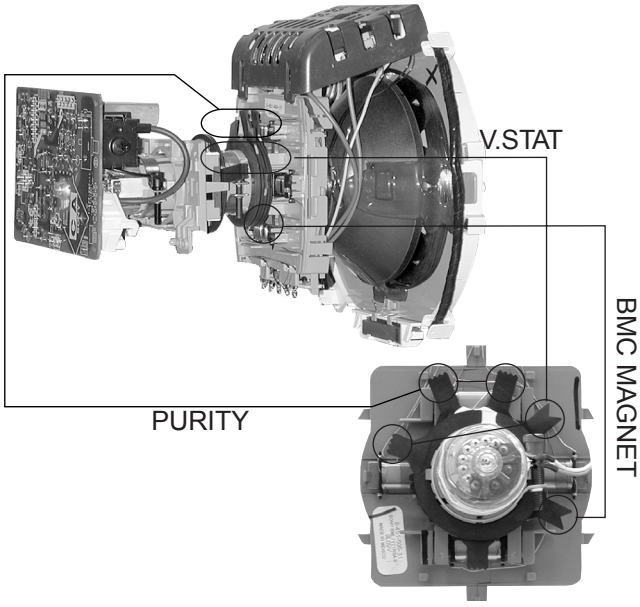
When the V. STAT magnet is moved in the direction of arrow a and b, red, green, and blue dots move as shown below:

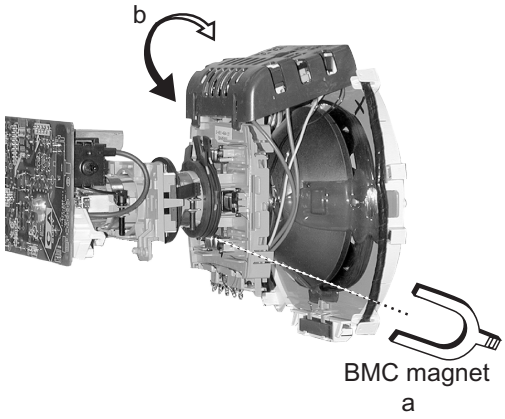


HORIZONTAL STATIC CONVERGENCE

If the blue dot does not converge with the red and green dots, peform the following:

1. Move BMC magnet (a) to correct insufficient H.Static convergence.
2. Rotate BMC magnet (b) to correct insufficient V.Static convergence.
3. After adjusting the BMC magnet, repeat Beam Landing Adjustment.

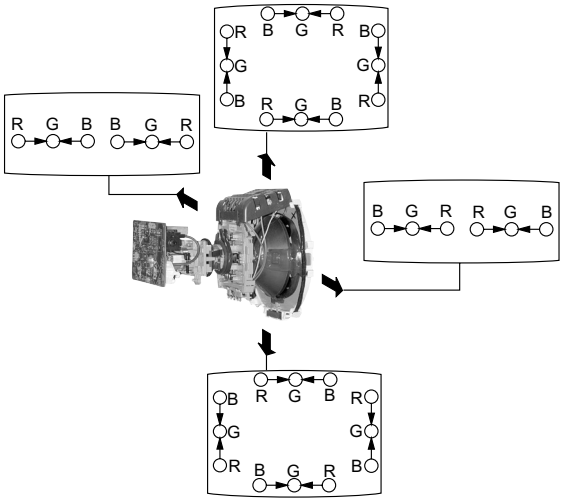




DYNAMIC CONVERGENCE ADJUSTMENT

Before performing this adjustment, perform Horizontal and Vertical Static Convergence Adjustment.

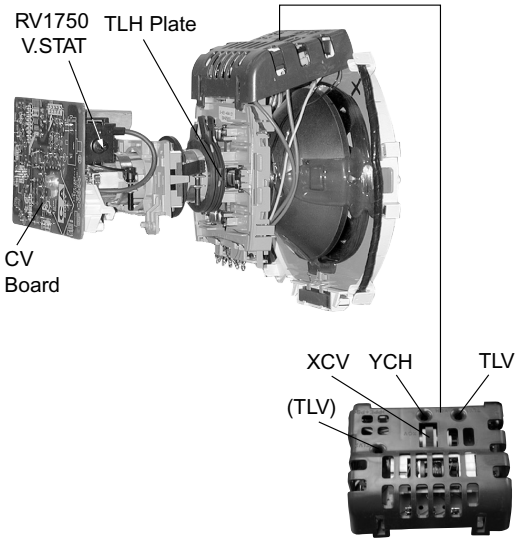
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown below:

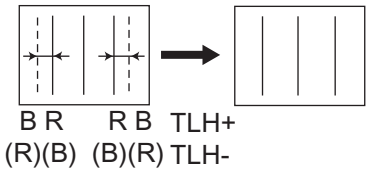


4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

TLH PLATE ADJUSTMENT

1. Input crosshatch pattern.
2. Adjust PICTURE QUALITY to standard, PICTURE and BRIGHTNESS to 50%, and OTHER to standard.
3 Adjust the Horizontal Convergence of red and blue dots by tilting the TLH plate on the deflection yoke.

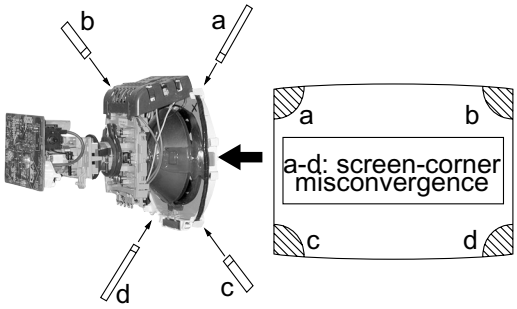




4. Adjust XCV core to balance X axis.
5. Adjust YCH VR to balance Y axis.
6. Adjust vertical red and blue convergence with V.TILT (TLV VR.)
   Note: Perform adjustment 3-6 while tracking items 1 and 2.

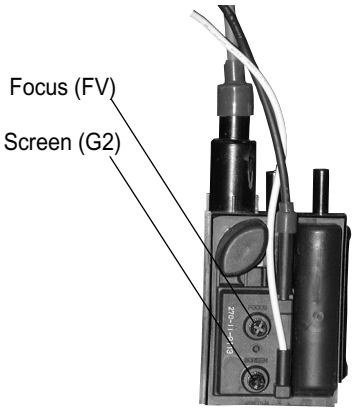
SCREEN-CORNER CONVERGENCE

1. Affix a permalloy assembly corresponding to the misconverged areas:



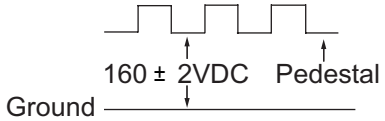
2-3. FOCUS

1. Adjust FOCUS control for best pictures.



2-4. SCREEN (G2)

1. Input a dot pattern.
2. Set the PICTURE and BRIGHTNESS controls at minimum and COLOR control at normal.
3. Adjust SBRT, GCUT, BCUT in service mode with an oscilloscope as shown below so that voltages on the red, green, and blue cathodes are 160 ± 2VDC.



4. Observe the screen and adjust SCREEN (G2) VR in FBT to obtain the faintly visible background of dot signal.

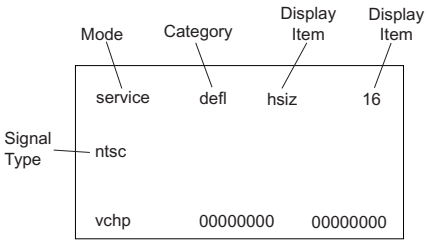
2-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

SERVICE MODE PROCEDURE

1. Standby mode (power off).
2. Press [Display] ➡ Channel [5] ➡ Sound Volume [+] ➡ Power on the Remote Commander (press each button within a second).

SERVICE ADJUSTMENT MODE ON

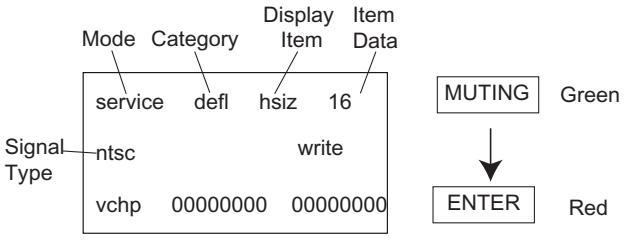
1. The CRT displays the time being adjusted.



2. Press [1] or [4] on the Remote Commander to select the time.
3. Press [3] or [6] on the Remote Commander to change the data.
4. Press [MUTING] then [ENTER] to save into the memory.

SERVICE ADJUSTMENT MODE MEMORY

Turn the set off then on to exit Service Adjustment Mode.



2-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal with burst.
2. Set to Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Adjust with SBRT if necessary.
5. Select GCUT and BCUT with [1] and [4].
6. Adjust with [3] and [6] for the best white balance.
7. Set the PICTURE and BRIGHTNESS to maximum.
8. Select GDRV and BDRV with [1] and [4].
9. Adjust with [3] and [6] for the best white balance.
10. To write into memory, press [MUTING] then [ENTER].

SECTION 3: SAFETY RELATED ADJUSTMENTS

3-1. ⋈ R565 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components which are marked with ◪ on the schematic diagram:

Part Replaced (◪)	Adjustment (⋈)
DY, T585, CRT, IC001, IC561, IC604, C507, C508, C506, T511, L510, C588, L588, C566, C561, C563, D567, D568, D566, PH602, R567, R568, R565, R566, R562, R563, R561, R528, R668.....A Board	HV HOLD-DOWN R565

PREPARATION BEFORE CONFIRMATION

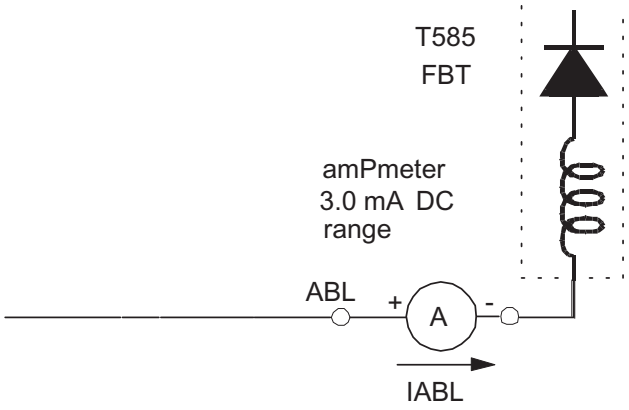
1. Using a Variac, apply AC input voltage: 120 ±2 VAC.
2. Turn the POWER switch ON.
3. Input a white signal and set the PICTURE and BRIGHTNESS controls to maximum.
4. Confirm that the voltage between C566 (+) or TP30 and ground is more than 105 VDC.

HOLD-DOWN OPERATION CONFIRMATION

1. Connect the current meter between Pin 11 of the FBT (T585) and the PWB land where Pin 11 would normally attach (See Figure 1 on the next page).
2. Input a dot signal and set PICTURE and BRIGHTNESS to minimum: IABL = 100 ± 100µA.
3. Confirm the voltage of A Board TP-23 is 138.0 ± 0.3VDC.
4. Connect the digital voltmeter and the DC power supply via Diode 1SS119 to C566 (+) and ground (See Figure 1 on next page).
5. Increase the DC power voltage gradually until the picture blanks out.
6. Turn DC power source off immediately.
7. Read the digital voltmeter indication (standard < 117VDC).
8. Input a white signal and set PICTURE and BRIGHTNESS to maximum: IABL = 1650 ± 100µA.
9. Repeat steps 4 to 7.

HOLD-DOWN READJUSTMENT

If the setting indicated in Step 2 of Hold-Down Operation Confirmation cannot be met, readjustment should be performed by altering the resistance value of R565 component marked with ⋈.



3-2. B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

Note: The following adjustments should always be performed when replacing the following components, which are marked with ◪ on the schematic diagram on the A Board:

A BOARD: ◪ IC604, PH602

1. Using a Variac, apply AC input voltage: 130 + 2.0 / - 0.0 VAC.
2. Input a DOT pattern at Q.C.
3. Set the PICTURE and the BRIGHTNESS controls to minimum.
4. Confirm the voltage of A Board between TP-23 & Ground is <136.6 VDC.
5. If step 4 is not satisfied, replace the components listed above, then repeat Steps 1 – 3.

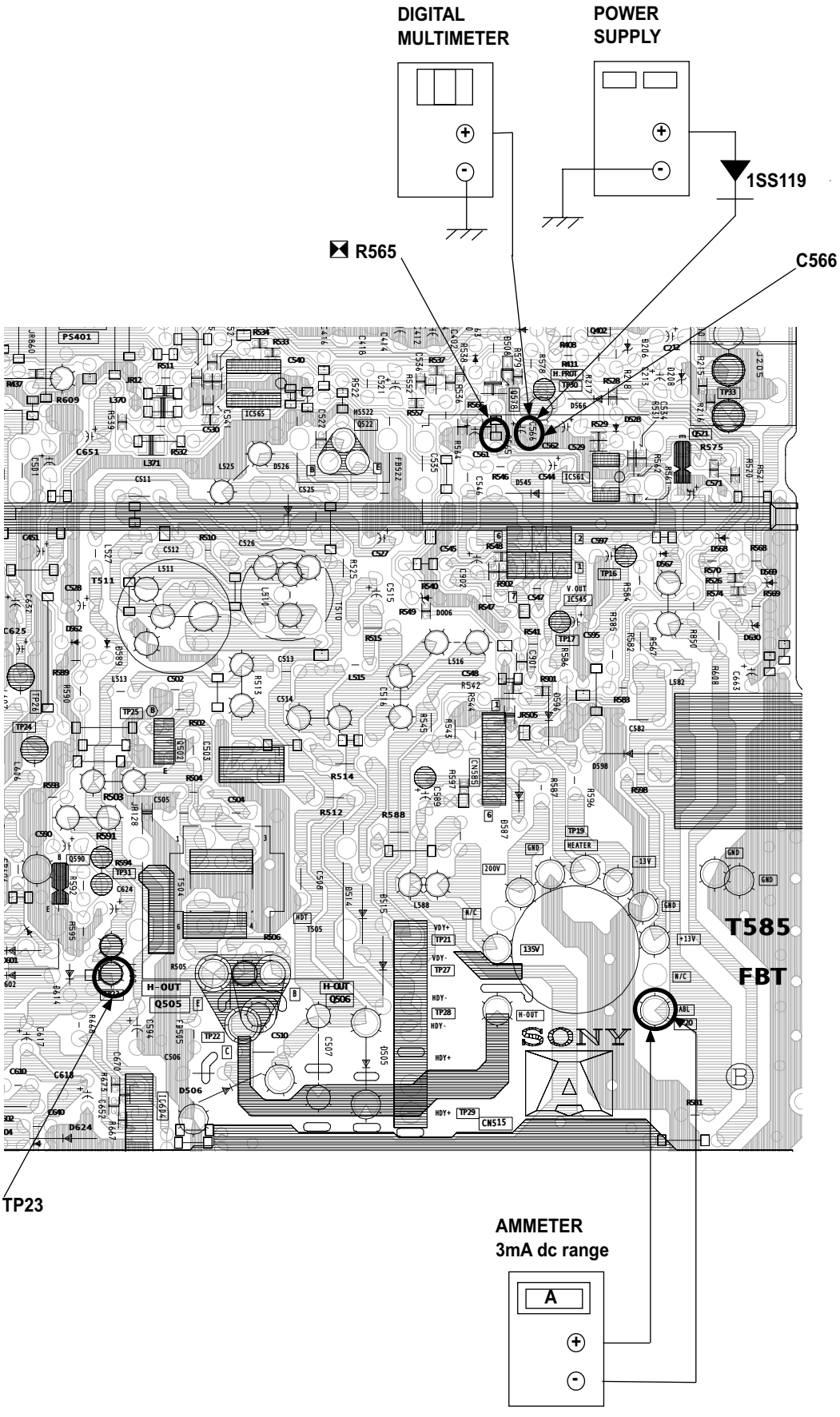

DIGITAL
MULTIMETER
POWER
SUPPLY
1SS119
R565
C566
TP23
AMMETER
3mA dc range
A
T585
FBT
H-OUT
Q505
H-OUT
Q506
SONY

Figure 1

SECTION 4: CIRCUIT ADJUSTMENTS

ELECTRICAL ADJUSTMENTS BY REMOTE COMMANDER

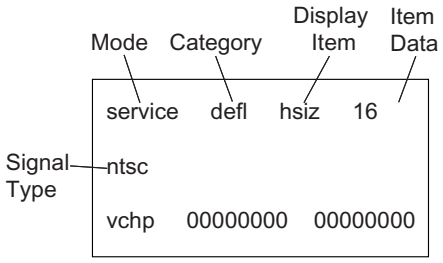
Use the Remote Commander (RM-Y180) to perform the circuit adjustments in this section.
Test Equipment Required: 1. Pattern generator 2. Frequency counter 3. Digital multimeter 4. Audio oscillator

4-1. SETTING THE SERVICE ADJUSTMENT MODE

1. Standby mode (Power off).
2. Press the following buttons on the remote commander within a second of each other:
   Display ➡ Channel 5 ➡ Sound Volumne + ➡ Power

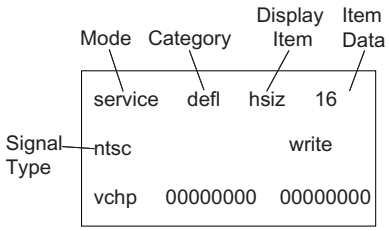
SERVICE ADJUSTMENT MODE ON

1. The CRT displays the item being adjusted.

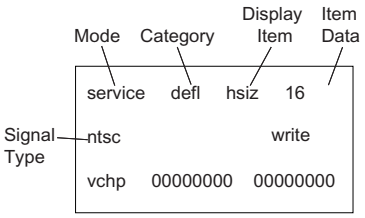


2. Press 1 or 4 on the Remote Commander to select the item.
3. Press 3 or 6 on the Remote Commander to change the data.
4. Press MUTING then ENTER to write into memory.

SERVICE ADJUSTMENT MODE MEMORY



1. Press 8 then ENTER on the Remote Commander to initialize.



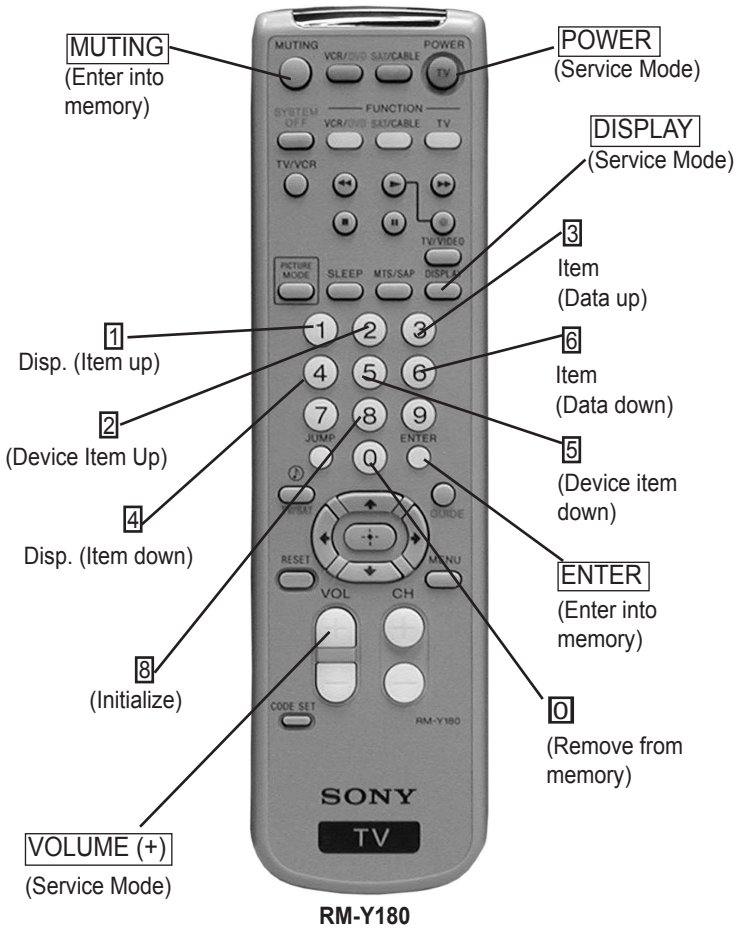
Carry out Step 1 when adjusting IDs 0-7 and when replacing and adjusting IC002

3. Press MUTING then ENTER to write into memory.
2. Turn set off then on to exit Service Adjustment Mode.

4-2. MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, pull out the plug from the AC outlet, then replace the plug in the AC outlet again.
2. Turn the power switch ON and set to Service Mode.
3. Call the adjusted items again to confirm they were adjusted.

4-3. REMOTE ADJUSTMENT BUTTONS AND INDICATORS



RM-Y180

ADJUSTMENT ITEMS (1 OF 8)

DEVICE "DEF"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	HSIZ	H SIZE(EW DC)	00-63	25
2	HPOS	H POSITION	00-63	41
3	VSIZ	V RAMP SIZE	00-63	25
4	VPOS	V POSITION(RAMP DC)not useful	00-63	34
5	VLIN	V LINEARITY	00-63	36
6	SCOR	S CORRECTION	00-63	39
7	VBOW	BOW	00-63	36
8	VANG	ANGLE	00-63	35
9	TRAP	EW TRAPESIUM	00-63	29
10	PAMP	EW PIN	00-63	39
11	UPIN	UPPER PIN	00-63	28
12	LPIN	LOWER PIN	00-63	29
13	TROT	TROT	00-255	128
14	HBLK	H BLK mode select	00-01	0
15	LBLK	HBLK front timing	00-63	11
16	RBLK	HBLK rear timing	00-15	35
17	VBLK	V BLK width	00-03	0
18	HMSK	TOP VEND(when MACROVISION)prevent OFF	00-01	0
19	HDW	H PULSE WIDTH(25u/19u)	00-01	1
20	AFC	AFC GAIN	00-01	0
21	AFC1	AFC1 TIME CONSTANT	00-07	3
22	AFCW	AFC1 PULL IN WIDE	00-01	1
23	CDMD	V DET WINDOW SW TIMING	00-03	1
24	HSS	SYNC SLICE LEVEL(H sepa)	00-03	0
25	VSS	SYNC SLICE LEVEL(V sepa)	00-03	3
26	SLDN	Auto Slice level DOWN	00-03	0
27	SLUP	Auto Slice level UP	00-01	0
28	JPSW	Jump SW	00-01	0
29	HOSC	H VCO fo ADJUST	00-255	5
30	EHT	EHT	00-15	6
31	EHTG	EHT MODE	00-01	0

DEVICE "16:9"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	PAMP	EW PIN	00-63	59
2	UPIN	UPPER PIN	00-63	15
3	LPIN	LOWER PIN	00-63	21
4	ACLV	ACL VTH	00-03	0
5	ABLV	ABL VTH	63-00	58

DEVICE "VP1"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	RDRV	R DRIVE	00-127	55
2	GDRV	G DRIVE when Color Temp. is "Cool" and "Neutral"	00-127	38
3	BDRV	B DRIVE when Color Temp. is "Cool" and "Neutral"	00-127	47
4	RCUT		00-1023	130
5	GCUT		00-1023	90
6	BCUT		00-1023	72
7	SCON	CONTRAST LEVEL	00-127	20
8	SHUE	TINT	00-127	8
9	SCOL	COLOR LEVEL	00-127	17
10	SBRT	BRIGHT	00-255	40
11	RON	R OUTPUT MUTE	00-01	1
12	GON	G OUTPUT MUTE	00-01	1
13	BON	B OUTPUT MUTE	00-01	1
14	BLLV	BLUE STRETCH(00:no <-> 11:deep)	00-03	1
15	MTRX	MATRIX RATIO SELECT	00-03	2
16	AXIS	R-Y PHASE OFFSET	00-63	48
17	SSHO	SHARPNESS GAIN(OVER)	00-63	17
18	SSHP	SHARPNESS GAIN(PRE)	00-63	26
19	SHPF	SHARPNESS fo(00:2 CLK <-> 11:5 CLK)	00-03	1

ADJUSTMENT ITEMS (2 OF 8)

DEVICE "VP1"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
20	SHCL	SHARPNESS CPRING LEVEL	00-15	0
21	SHMX	SHARPNESS LIMITER LEVEL	00-15	15
22	ACLV	ACL VTH	00-03	0
23	ABLV	ABL VTH	00-63	0
24	AKBD	AKB Self Diagnostic Counter(@1sec)	00-07	0
25	AKBS	AKB H/W S/W Switch	00-02	1
26	REFP	AKB REFPLS timing	00-01	1
27	YNRC	YNR LIMITER LEVEL	00-15	15
28	BKON	BLACK STRETCH ON	00-01	1
29	BKTH	BLACK STRETCH DETECTOR TRESH LEVEL	00-255	22
30	BKAR	BLACK STRETCH DETECTOR TRESH AREA	00-03	1
31	BKSP	BLACK STRETCH START POINT	00-03	3

DEVICE "VP2"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	VMLO	VM LEVEL at "Low" Setting	00-15	10
2	VMHI	VM LEVEL at "High" Setting	00-15	15
3	VMDL	VM DELAY	00-15	6
4	VMPL	VM POLARITY	00-01	0
5	VMWD	VM WIDTH	00-03	0
6	VMCL	VM CORING LEVEL	00-15	0
7	VMMX	VM LIMITER LEVEL	00-15	15
8	CKLV	COLOR KILLER VTH	00-127	1/YUV:0
9	CKON	FORCE KILLER	00-01	0
10	ALFA	ADAPTIVE DET SENSITIVITY	00-03	2
11	YCMD	YC SEPA FORCE SELECT(00:ADAPTIVE 01:H 10:V 11:HV)	00-03	0
12	VACL	V APERTURE CORING LEVEL	00-15	0
13	VAGA	V APERTURE GAIN LEVEL	00-15	Soft Cont'l
14	VAMX	V APERTURE LIMITER LEVEL	00-15	3
15	GAMM	GAMMA(00:no <-->11:deep)	00-03	Soft Cont'l
16	YDLY	Y DELAY TIME	00-03	3/YUV:3
17	CDLY	C DELAY	00-03	2/YUV:2
18	YOFF	Y OUTPUT MUTE	00-01	0
19	CBPF	C BPF fo HI	00-01	0/YUV:0
20	CLIM	C OUTPUT LIMITER	00-15	15
21	YFSL	Y BAND WIDTH	00-03	0
22	CFSL	C BAND WIDTH	00-03	0
23	BGPP	BGP(for C DECODER)TIMING	00-31	8
24	NRCH	NOISE DET TIME CONSTANT	00-03	0
25	NRCL	NOISE DET TIME CONSTANT	00-255	8
26	NRVL	NOISE DET VTH	00-255	16
27	NRVH	NOISE DET VTH	00-255	0
28	GDOF	G DRIVE	00-31	18
29	BDOF	B DRIVE	00-31	31
30	GCOF	G CUTOFF	00-31	02
31	BCOF	B CUTOFF	00-31	00
32	DCTV	DCTRANSFER VTH	00-127	5
33	DCTG	DCTRANSFER GAIN	00-31	Soft Cont'l

ADJUSTMENT ITEMS (3 OF 8)

DEVICE "VIVID"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	VPIC	Picture(VIVID)	00-63	63
2	VBRI	Brightness(VIVID)	00-63	31
3	VCOL	Color(VIVID)	00-63	31
4	VHUE	Hue(VIVID)	00-63	31
5	VSHA	Sharpness(VIVID)	00-63	31
6	VVM	VM(VIVID)	00-02	2
7	VTRI	Color Temp(VIVID)	00-02	0
8	VAPA	Aperture G(VIVID)	00-15	7
9	VGMA	Gamma(VIVID)	00-03	3
10	DCTG	DCT LV(VIVID)	00-03	16

DEVICE "STD"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	VPIC	Picture(STANDARD)	00-63	50
2	VBRI	Brightness(STANDARD)	00-63	37
3	VCOL	Color(STANDARD)	00-63	31
4	VHUE	Hue(STANDARD)	00-63	31
5	VSHA	Sharpness(STANDARD)	00-63	31
6	VVM	VM(STANDARD)	00-02	1
7	VTRI	Color Temp(STANDARD)	00-02	1
8	VAPA	Aperture G(STANDARD)	00-15	7
9	VGMA	Gamma(STANDARD)	00-03	3
10	DCTG	DCT LV(STANDARD)	00-03	16

DEVICE "MOVIE"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	VPIC	Picture(MOVIE)	00-63	31
2	VBRI	Brightness(MOVIE)	00-63	54
3	VCOL	Color(MOVIE)	00-63	25
4	VHUE	Hue(MOVIE)	00-63	31
5	VSHA	Sharpness(MOVIE)	00-63	31
6	VVM	VM(MOVIE)	00-02	0
7	VTRI	Color Temp(MOVIE)	00-02	2
8	VAPA	Aperture G(MOVIE)	00-15	7
9	VGMA	Gamma(MOVIE)	00-03	3
10	DCTG	DCT LV(MOVIE)	00-03	16

DEVICE "SPORTS"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	VPIC	Picture(SPORTS)	00-63	63
2	VBRI	Brightness(SPORTS)	00-63	31
3	VCOL	Color(SPORTS)	00-63	34
4	VHUE	Hue(SPORTS)	00-63	31
5	VSHA	Sharpness(SPORTS)	00-63	31
6	VVM	VM(SPORTS)	00-02	2
7	VTRI	Color Temp(SPORTS)	00-02	0
8	VAPA	Aperture G(SPORTS)	00-15	7
9	VGMA	Gamma(SPORTS)	00-03	3
10	DCTG	DCT LV(SPORTS)	00-03	16

ADJUSTMENT ITEMS (4 OF 8)

DEVICE "Y"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	COFI	0:4 Line delays 1:2 Line delays	00-01	0
2	YNRS	YNR ON	00-01	0
3	YTHR	Y SIGNAL GENERATE from 2DYCS	00-01	0
4	Y2D	Y SIGNAL GENERATE from 2DYCS	00-01	0
5	2DFX	C SIGNAL GENERATE from H/V BPF only	00-01	1
6	CLPS	Y CLAMP TIME CONSTANT	00-01	1
7	VLPF	Y_LPF(ANALOG) fo Adjust	00-03	3
8	CLPF	C_LPF(ANALOG) fo Adjust	00-03	3
9	BKHS	BLACK STRETCH HYSTERESIS	00-31	1
10	BPFB	YCS HBPF SELECT(BACK)	00-03	1
11	BPFF	YCS HBPF SELECT(FRONT)	00-01	1

DEVICE "C"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	FORG	CHROMA DECODER PHASE SELECT	00-03	0
2	FSEL	CHROMA DECODER CLK SELECT	00-01	0/YUV:0
3	ACTL	ANALOG ACC AMP MAX GAIN	00-03	3
4	A1FL	ANALOG ACC hysteresis	00-255	34
5	A1FH		00-01	0
6	A1ON	ANALOG ACC AMP ON LEVEL	00-127	12
7	MV	MACROVISION(BURST) DET TRESH	00-15	0
8	MV1S	MACROVISION(BURST) DET ON	00-01	1
9	MV2S	MACROVISION(BURST) DET POSITION	00-01	1
10	ACCS	ACC ON/OFF	00-01	0/YUV:1
11	KILS	KILLER DET SELECT	00-01	0/YUV:1
12	AASL	C DECODER TIME CONSTANT(32,16,8,1H)	00-03	3
13	BASL	ACC TIME CONSTANT	00-03	0
14	ATIM	ANALOG ACC HYSTERESIS SELECT	00-03	0
15	VMSK	ACC V BLK OFF WIDTH	00-07	0
16	A3ON	ACC MAX GAIN	00-01	0
17	INTE	C DECODER INTEGRATOR ENABLE	00-01	0
18	SIN	C DECODER PHASE V ENABLE	00-01	0
19	CKVT	PLL STOP BURST LEVEL	00-03	1
20	XFFR	VCXO FORCE FREERUN	00-01	0/YUV:1
21	ACCV	C DECODER PHASE V ENABLE	00-01	1
22	BWSL	KILLER DET SELECT	00-01	1/YUV:1
23	BWDT	PLL KILLER VTH	00-03	0/YUV:3
24	A23E	AMP2,3 ON/OFF ENABLE(0 FIX)	00-01	1
25	A2ON	ABL VTH	00-127	12
26	A3ON	ACL VTH	00-127	12
27	A2FL	AMP2 OFF LEVEL lower	00-255	34
28	A2FH	AMP2 OFF LEVEL upper	00-01	0
29	A3FL	AMP3 OFF LEVEL lower	00-255	34
30	A3FH	AMP3 OFF LEVEL upper	00-01	0
31	AXTH	AXS HYS	00-63	30
32	ACTH	ROM HYS	00-63	10
33	AVAV	AVE SEL AV	00-03	3
34	B2TH	B2COMP	00-127	0

ADJUSTMENT ITEMS (5 OF 8)

DEVICE "RGB"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	AMUT	RGB POWER ON MUTE	00-01	0
2	PMUT	RGB MUTE(EXCEPT OSD)	00-01	1
3	VBLK		00-01	0
4	CORL	R CUTOFF lower	00-255	200
5	CORH	R CUTOFF upper	00-01	0
6	COGL	G CUTOFF lower when Color Temp. is "Cool" and "Neutral"	00-255	200
7	COGH	G CUTOFF upper when Color Temp. is "Cool" and "Neutral"	00-01	0
8	COBL	B CUTOFF lower when Color Temp. is "Cool" and "Neutral"	00-255	200
9	COBH	B CUTOFF upper when Color Temp. is "Cool" and "Neutral"	00-01	0
10	ABLS	ABL SELECT (ON:00, OFF:01)	00-01	0
11	ACLS	ACL ON (ON:00, OFF:01)	00-01	1
12	ALSP	ACL SPEED	00-03	1
13	ALRS	ACL RECOVER SPEED	00-15	2
14	ALAS	ACL ATTACK SPEED	00-15	9
15	ABLG	ABL GAIN	00-15	15
16	ALS2	ACL ATTACK SPEED(2)	00-03	2
17	AKBS	AKB MODE	00-01	1
18	AKBP	AKB PULSE HEIGHT	00-63	55
19	OSDL	OSD LIMIT SELECT	00-01	0
20	MPXS	UV MULTIPLEX ON	00-01	0/YUV:0
21	CXUV	YC/YUV SELECT	00-01	0/YUV:1
22	UVIN	U/V INVERT	00-01	0/YUV:0
23	UVOS	UV OFFSET CANCELER ON	00-01	0/YUV:0
24	ACL	SOFT ACL CONTROL	00-63	63
25	HBLS	H BLK OFF	00-01	0
26	VENS	V-latch OFF	00-01	0
27	UOFS	U IN OFFSET	00-15	4
28	VOFS	V IN OFFSET	00-15	9
29	AABL	ANALOG ABL THRESHOLD LEVEL CONTROL	00-15	0
30	AABG	ANALOG ABL GAIN CONTROL	00-01	0
31	AALG	ANALOG ACL GAIN CONTROL	00-01	0
32	AABS	ANALOG ABL ON/OFF CONTROL (ON:01, OFF:00)	00-01	0
33	AALS	ANALOG ACL ON/OFF CONTROL (ON:01, OFF:00)	00-01	1

ADJUSTMENT ITEMS (6 OF 8)

DEVICE "DEFD"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	VSTP	V OUTPUT STOP	00-01	0
2	HFFR	AFC1 FORCE FREERUN	00-01	0
3	HFUP	H FREERUN FREQUENCY UP(700Hz)	00-01	0
4	VPHA	V PHASE(V POSITION ADJUST)	00-15	0
5	JSWW	Jump Pulse Width	00-01	0
6	EWG	EWV AD OUTPUT LEVEL(6db)	00-01	0
7	EWCL	EW/VRAMP DA CLOCK SELECT	00-03	2/YUV:2
8	EWDI	EW/VRAMP DA DITHER	00-01	0
9	XF0A	VCXO FREERUN ADJUST	00-15	0
10	BGST	BGP(for PLL) TIMING	00-63	17
11	SKWI	Skew correcter reference phase	00-01	0/YUV:0
12	XPHA	VCXO PHASE ADJUST	00-15	10
13	SKEW	Skew corrector phase control	00-07	0/YUV:3
14	HRMP	AFC2 TIME CONSTANT	00-03	0
15	RPLU	REF PLL TIME CONSTANT	00-07	3
16	RPLB	REF PLL TIME CONSTANT	00-01	1
17	XF0B	VCXO Fo ADJUST	00-03	0
18	RPLS	REF VCO FB LOOP SELECT	00-01	0
19	SSM	SyncSepaMasking CONTROL	00-01	0
20	VSAG	V-SAG prevent ON	00-01	0
21	AFC2	AFC2 GAIN CONTROL	00-03	0
22	VRFL	V RAMP FILTER SWITCHING OFF	00-01	0
23	SSLP	LPF pre SYNC SEPA ON/OFF	00-01	0
24	IMTS	I.M. TEST	00-01	0
25	XPLU	ACP TIME CONSTANT	00-01	1
26	8FSC	8fscCLK Skew OFF	00-01	1/YUV:1
27	4FS2	4fscCLK Skew OFF	00-01	1/YUV:1
28	EWVR	DSDAC V RESET Enable	00-01	0
29	VLOF	IIC V Latch OFF(for TEST)	00-01	0
30	1WIN	FORCE 1Window	00-01	1
31	BGPC	ANGLE Return current up	00-01	0
32	MHDL	ANGLE Return current up timing	00-01	1
33	BFRE	force V FREERUN	00-01	0
34	ANGG	ANGLE Retun current up	00-01	1
35	ANGT	ANGLE Retun current up timing	00-01	0
36	DOSD	Digital OSD ON	00-01	0
37	ANGS	AFC2 ANGLE/BOW INHIBIT	00-01	0
38	HRPP	FRAMP RRAMP H OUT CONTROL RANGE	00-15	8
39	VF50	FORCE V FREERUN 50Hz	00-01	0
40	CLKS	TBC clock system select	00-03	0
41	VBHK	V BLK HALF KILL	00-01	0
42	DSYC	CVBS INPUT CONTROL	00-01	0
43	VPW	V Pulse Wide	00-01	1
44	QSW	MODULATOR FEEDBACK GAIN CONTROL	00-01	0
45	ADTY	CLOCK DUTY CONTROL at IIC QSWITCH=ON	00-01	0
46	DTH	DITHER THRESHOLD LEVEL CONTROL at IIC AUTOD=ON	00-03	1
47	HBSW	HBLK REFERENCE AFC1/AFC2	00-01	0
48	DSCS	ΔΣDAC CLOCK ON/OFF CONTROL	00-01	0

ADJUSTMENT ITEMS (7 OF 8)

DEVICE "OTHER"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	PCLP	SYNC TIP/PEDESTAL CLAMP SELECT	00-01	0
2	VRT	ADC REFERENCE (00:1.15Vpp 01:1.25Vpp 10:1.35Vpp 11:1.45Vpp)	00-03	1/YUV:1
3	AM	INTERIGENT MONITOR OUTPUT SELECT(analog)	00-15	0
4	DME	INTERIGENT MONITOR OUTPUT SELECT(digital)	00-01	0
5	DM	INTERIGENT MONITOR OUTPUT SELECT(digital)	00-31	0
6	14HI	4fsc(Skew)CLK POLARITY	00-01	0
7	14HD	4fscCLK(Skew)CLK DELAY ADJUST	00-03	1
8	28I	8fscCLK POLARITY	00-01	1
9	28D	8fscCLK DELAY ADJUST	00-03	1
10	ADCD	ADC CLK DELAY ADJUST	00-03	1/YUV:0
11	CLKS	AD/LOGIC CLK SWAP	00-01	0/YUV:0
12	HDSL	HD OUT(for MCU)SELECT	00-01	1
13	CPSL	PLL CP LATCH ON	00-01	0
14	CPCL	PLL CP LATCH CLOCK	00-01	0
15	CPCP	PLL CP LATCH POLARTY	00-01	0
16	DUMY	DUMMY	00-0F	1

DEVICE "OSD"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	HT	HALF TONE LEVEL	00-03	0
2	OSLR	R OSD LEVEL	00-63	27
3	OSLG	G OSD LEVEL	00-63	27
4	OSDC		00-03	0
5	OSDB	B OSD LEVEL	00-63	27

DEVICE "S/W ADKB"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	SRIL	S/W AKB RED OUTPUT Lower	00-255	Soft Cont'l
2	SRIH	S/W AKB RED OUTPUT Upper	00-01	Soft Cont'l
3	SGIL	S/W AKB GREEN OUTPUT Lower	00-255	Soft Cont'l
4	SGIH	S/W AKB GREEN OUTPUT Upper	00-01	Soft Cont'l
5	SBIL	S/W AKB BLUE OUTPUT Lower	00-255	Soft Cont'l
6	SBIH	S/W AKB BLUE OUTPUT Upper	00-01	Soft Cont'l
7	SLM1	S/W AKB LIMIT DATA 1	00-255	4
8	SLM2	S/W AKB LIMIT DATA 2	00-255	29
9	SLM3	S/W AKB LIMIT DATA 3	00-255	130
10	SAD1	S/W AKB ADD DATA 1	00-255	1
11	SAD2	S/W AKB ADD DATA 2	00-255	1
12	SBIT	S/W AKB BIT SHIFT DATA	00-05	0
13	SNOP	S/W AKB POWER ON NOP TIMER COUNTER DATA	00-FF	1
14	SERL	S/W AKB BIT ERROR JUDGE LEVEL	01-80	124
15	SPWC	S/W AKB ERROR JUDGE COUNTER DATA	01-FF	2
16	SLMC	S/W AKB LIM2/LIM3 JUDGE COUNTER DATA	01-FF	10
17	SPWL	S/W AKB POWER ON MUTE OFF JUDGE LEVEL	01-80	30
18	SPMT	S/W AKB POWER ON MUTE EXIT TIMER DATA(@100ms)	00-FF	120
19	SEEP	S/W AKB INITIAL DATA EEPROM WRITE TIMER(@1sec)	00-FF	20

ADJUSTMENT ITEMS (8 OF 8)

DEVICE "AUDIO PROCESSOR"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	SBAL	Sub Balance	00-07	4
2	SBAS	Sub Bass	00-07	0
3	STRE	Sub Treble	00-07	0
4	SRL	Surround Level	00-01	0
5	BBOL	Surround Off-BBE Low	00-15	5
6	BBOH	Surround Off-BBE High	00-15	8
7	BBSL	Simulate BBE Low	00-15	2
8	BBSH	Simulate BBE High	00-15	5
9	BBGL	WOW Game BBE Low	00-15	5
10	BBGH	WOW Game BBE High	00-15	9
11	BBTL	SRS BBE Low	00-15	3
12	BBTH	SRS BBE High	00-15	5
13	VFIX	Audio output fix data	00-255	240
14	AGCL	AGC level	00-03	2

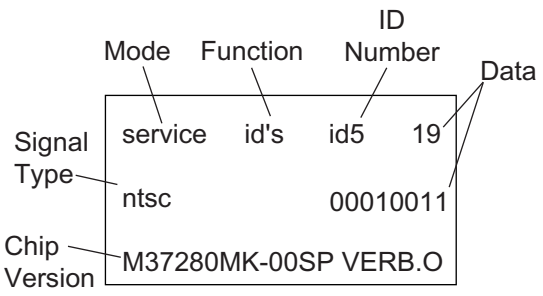
DEVICE "MICROPROCESSOR"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
1	DISP	OSD horizontal offset	00-127	53
2	CCHP	Closed Caption Horizontal Position	00-7E	73
3	HRLW	Low limit of H-pulse counting window (RF)	00-255	16
4	HRHG	High limit of H-pulse counting window (RF)	00-255	64
5	HSLW	Low limit of H-pulse counting window (S-Video)	00-255	16
6	HSHG	High limit of H-pulse counting window (S-Video)	00-255	64
7	HSDT	H-pulse Detection(S-Video)	00-255	8

DEVICE "FEATURE"

Item#	OSD	DETAIL	Range (DEC)	Initial Data
	ID0	Language related	00-255	SEE ID MAP
	ID1	Video related	00-255	SEE ID MAP
	ID2	Audio related	00-255	SEE ID MAP
	ID3	Miscellaneous	00-255	SEE ID MAP
	ID4	Miscellaneous	00-255	SEE ID MAP
	ID5	Miscellaneous	00-255	SEE ID MAP
	ID6	Miscellaneous	00-255	SEE ID MAP
	ID7	Miscellaneous	00-255	SEE ID MAP

Notes:
Range (DEC) shows the range of possible setting for each Adjustment Mode.
Initial Data shows the standard settings for each Adjustment Mode.



4-4. ID MAP TABLE

Model	Destination	ID-O	ID-1	ID-2	ID-3	ID-4	ID-5	ID-6	ID-7
KV-21FA210	LATIN NORTH	81	23	231	131	160	48	0	214
KV-21FA210	LATIN SOUTH	81	23	231	131	160	48	0	214

4-5. A BOARD ADJUSTMENTS

H. FREQUENCY (FREE RUN) CHECK

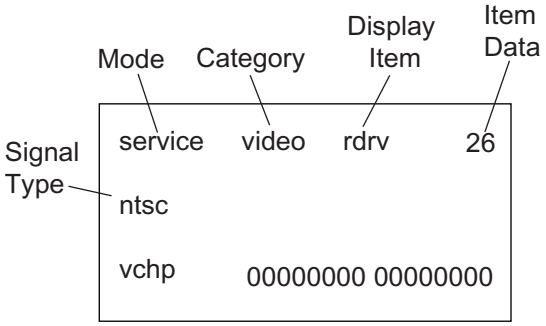
1. Input a TV mode (RF) with no signal.
2. Connect a frequency counter to base of Q502 (TP-25 H. DRIVE) on the A Board.
3. Check H. Frequency for 15735 ± 200 Hz.

V. FREQUENCY (FREE RUN) CHECK

1. Select video 1 with no signal input.
2. Set the conditions for a standard setting.
3. Connect the frequency counter to TP-27 (V OUT) or CN515 pin ⑥ (V DY+) and ground on the A Board .
4. Check that V. Frequency shows 60 ± 4 Hz.

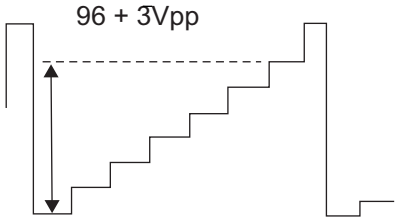
DRIVE (SCON)

1. Input a color-bar signal and set the level to 75%.
2. Set in Standard mode.
3. Activate the Service Adjustment Mode.
4. Set AALS, ABLS, GON and BON items. Using 3 and 6 set each to the following values. Leave RON set to “1”.



AALS: OFF (0)
ABLS: OFF (1)
R ON: ON (1)
G ON: OFF (0)
B ON: OFF (0)

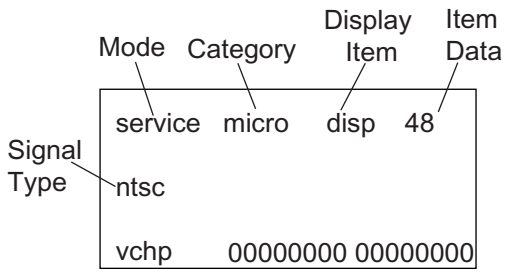
5. Connect an oscilloscope probe to CV Board, J1751Pin 12 (KR) (Red Out) .
6. Select SCON with 1 and 4 .
7. Adjust the value of SCON with 3 and 6 for 96 ± 3Vpp.



8. Reset AALS, ABLS, GON and BON values to “1”.
   AALS: ON (1)
   ABLS: ON (0)
   R ON: ON (1)
   G ON: ON (1)
   B ON: ON (1)
9. Press MUTING then ENTER to save into the memory.

DISPLAY POSITION ADJUSTMENT (DISP)

1. Input a color-bar signal.
2. Set to Service Adjustment Mode.
3. Select DISP with 1 and 4 .
4. Adjust values of DISP with 3 and 6 to adjust characters to the center.
5. Write to memory by pressing MUTING then ENTER .
6. Check to see if the text is displayed on the screen.



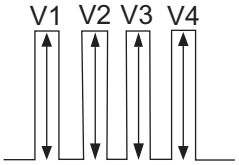
SUB BRIGHT ADJUSTMENT (SBRT)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Select the SBRT item with 1 and 4 .
5. Adjust the values of SBRT with 3 and 6 to obtain a faintly visible crosshatch.
6. Press MUTING then ENTER to save into the memory.

SUB HUE, SUB COLOR ADJUSTMENT (SHUE, SCOL)

1. Input color-bar signal at 75%.
2. Activate the Service Adjustment Mode.
3. Set (PIC) to Max and (COL) to 50%.
4. Connect an oscilloscope probe to CV Board, CN301Pin ④ Blue Out.
5. Select the SHUE and SCOL item with 1 and 4 .
6. While showing the SHUE item, adjust the waveform with 1 and 4 until the second and third bars show the same level (V2 = V3 < 0.15Vp-p). Set Sub Hue -2 Step.

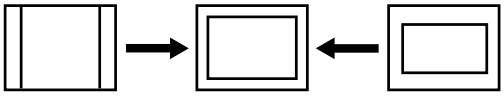
7. While showing the SCOL item, adjust the waveform with 3 and 6 until the first and fourth bars show the same level (V1 = V4 < 0.15Vp-p). Set Sub Col +3 Step.



8. Press MUTING then ENTER to save into the memory.

V. SIZE ADJUSTMENT (VSIZ)

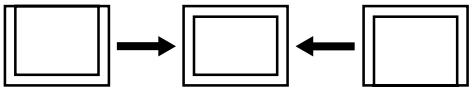
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VSIZ item with 1 and 4 .
4. Adjust value of VPOS with 1 and 4 for the best vertical center.
5. Press MUTING then ENTER to save into the memory.



V. CENTER ADJUSTMENT (VPOS)

Perform this adjustment after performing H. Frequency (Free Run) Check.

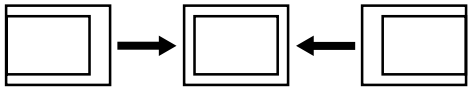
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VPOS item with 1 and 4 .
4. Adjust value of VPOS with 3 and 6 for the best vertical center.
5. Press MUTING then ENTER to save into the memory.



H. CENTER ADJUSTMENT (HPOS)

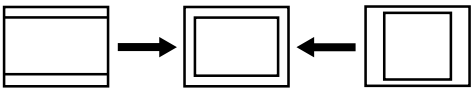
Perform this adjustment after performing H. Frequency (Free Run) Check.

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the HPOS item with 1 and 4 .
4. Adjust the value of HPOS with 3 and 6 for the best horizontal center.
5. Press MUTING then ENTER to save into the memory.



H. SIZE ADJUSTMENT (HSIZ)

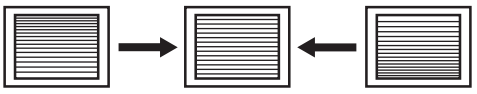
1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Select HSIZ with 1 and 4 .
4. Adjust with 3 and 6 for the best horizontal size.
5. Press MUTING then ENTER to save into the memory.



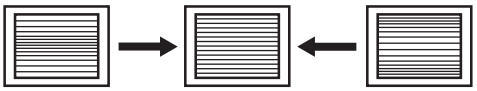
V. LINEARITY (VLIN), V. CORRECTION (SCOR), PIN AMP (PAMP), AND HORIZONTAL TRAPEZOID (HTRP) ADJUSTMENTS

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VLIN, SCOR, PAMP, and HTRP with with 1 and 4.
4. Adjust with 3 and 6 for the best horizontal size.
5. Press MUTING then ENTER to save into the memory.

V LINEARITY (VLIN)

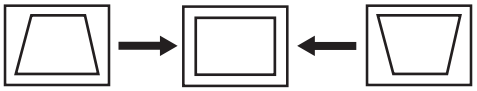


V CORRECTION (SCOR)



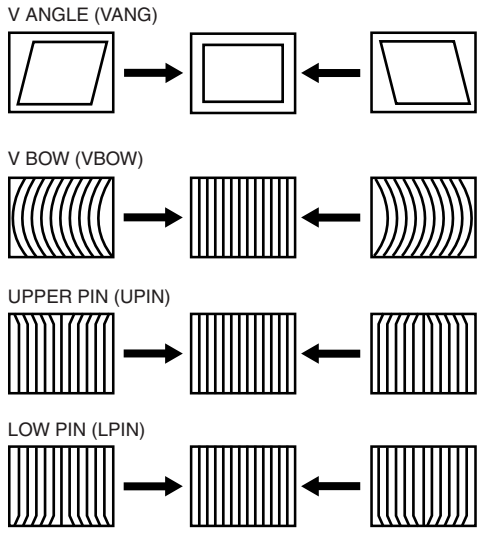
PIN AMP (PAMP)

HORIZONTAL TRAPEZOID (HTRP)



V. ANGLE (VANG), V. BOW (VBOW), UPPER PIN (UPIN) AND LOW PIN (LPIN) ADJUSTMENTS

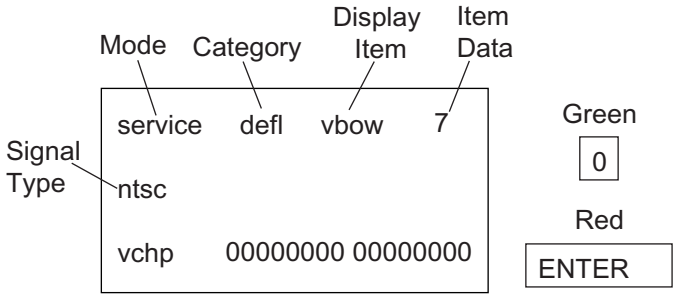
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VANG, VBOW, UPIN, and LPIN with 1 and 4.
4. Adjust with 3 and 6 for the best picture.
5. Press MUTING then ENTER to save into the memory.



SERVICE ADJUSTMENT MODE MEMORY

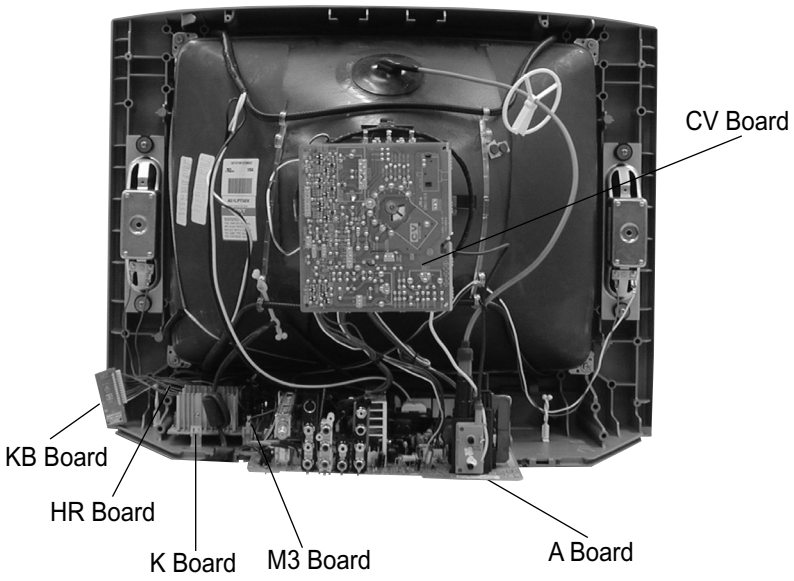
1. After completing all adjustments, press 0 then ENTER .

Read From Memory



SECTION 5: DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



5-2. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM INFORMATION

All capacitors are in µF unless otherwise noted. pF : µµF 50WV or less are not indicated except for electrolytics and tantalums.

All electrolytics are in 50V unless otherwise specified.

All resistors are in ohms. k=1000, M=1000k

Indication of resistance, which does not have one for rating electrical power, is as follows: Pitch : 5mm Rating electrical power :

$^1/_4$ W in resistance, $^1/_{10}$ W and $^1/_8$ W in chip resistance.

: nonflammable resistor.

: fusible resistor.

△ : internal component.

▭ : panel designation and adjustment for repair.

⊥ : earth ground

⏚ : earth-chassis

All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

Readings are taken with a color-bar signal input.

Readings are taken with a 10M digital multimeter.

Voltages are DC with respect to ground unless otherwise noted.

Voltage variations may be noted due to normal production tolerances.

All voltages are in V.

S : Measurement impossibility.

: B-line. (Actual measured value may be different).

: signal path. (RF)

Circled numbers are waveform references.

The components identified by ⋈ in this basic schematic diagram have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be necessary, replace only with the value originally used.

When replacing components identified by ◪, make the necessary adjustments as indicated. If the results do not meet the specified value, change the component identified by ⋈ and repeat the adjustment until the specified value is achieved. (Refer to Section 3: Safety Related Adjustments on Page 15.)

When replacing the parts listed in the table below, it is important to perform the related adjustments.

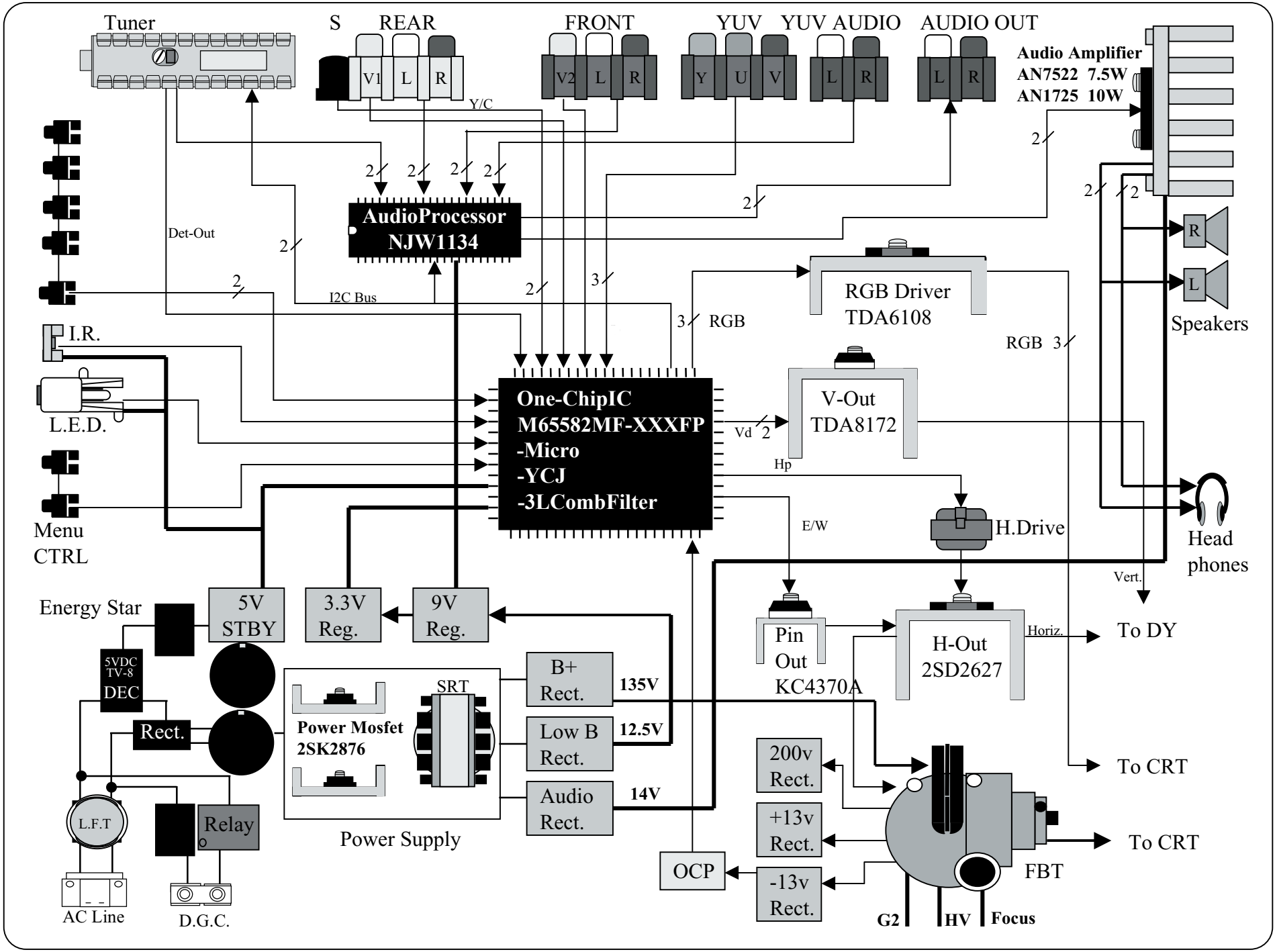
Part Replaced (◪)	Adjustment (⋈)
DY, T585, CRT, IC001, IC561, IC604, C507, C508, C506, T511, L510, C588, L588, C566, C561, C563, D567, D568, D566, PH602, R567, R568, R565, R566, R562, R563, R561, R528, R668.....A Board	HV HOLD-DOWN R565

REFERENCE INFORMATION

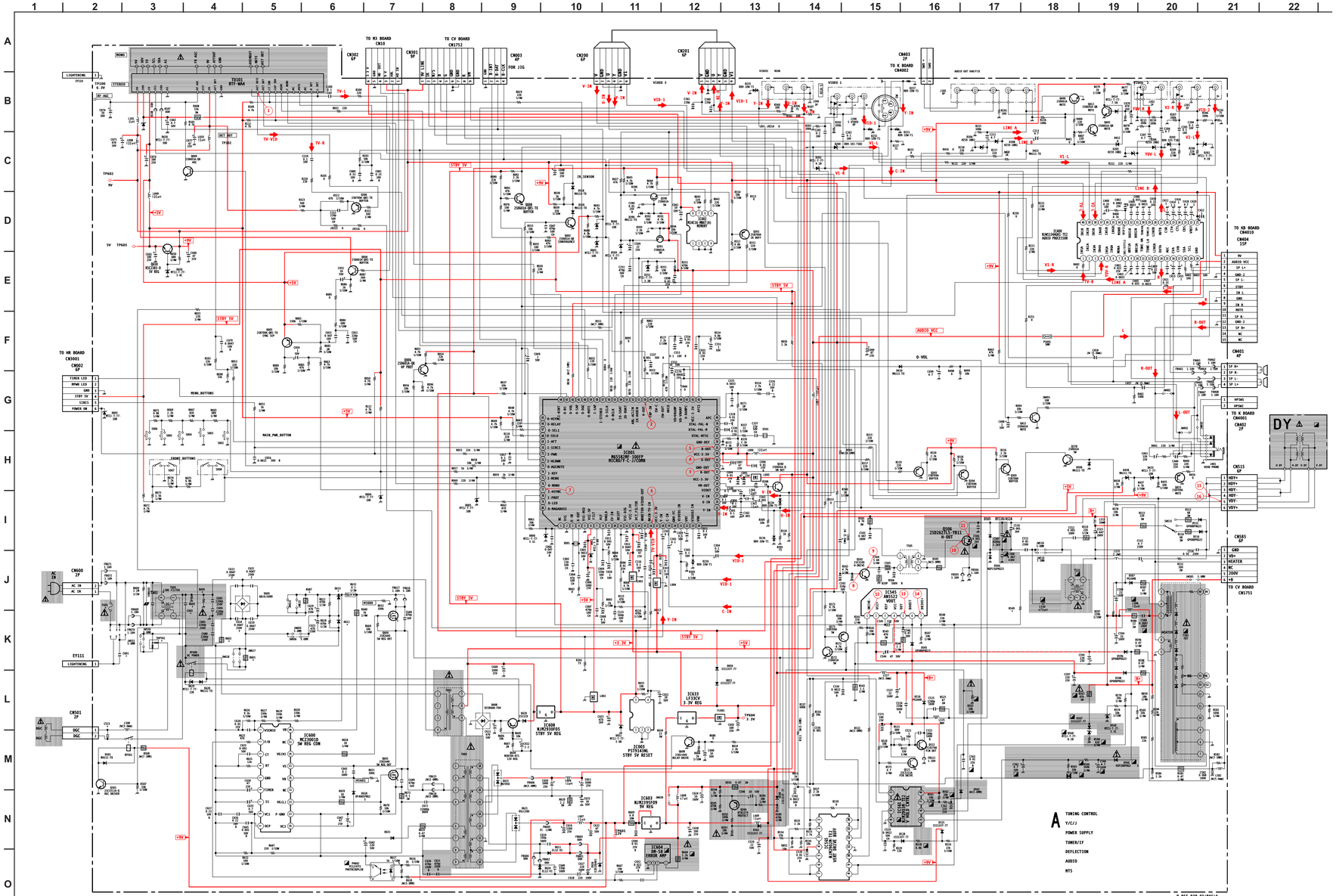
RESISTOR	**: RN**	**METAL FILM**
	: RC	**SOLID**
	: FPRD	**NONFLAMMABLE CARBON**
	: FUSE	**NONFLAMMABLE FUSIBLE**
	: RW	**NONFLAMMABLE WIREWOUND**
	: RS	**NONFLAMMABLE METAL OXIDE**
	: RB	**NONFLAMMABLE CEMENT**
	: ※	**ADJUSTMENT RESISTOR**
COIL	**: LF-8L**	**MICRO INDUCTOR**
CAPACITOR	**: TA**	**TANTALUM**
	: PS	**STYROL**
	: PP	**POLYPROPYLENE**
	: PT	**MYLAR**
	: MPS	**METALIZED POLYESTER**
	: MPP	**METALIZED POLYPROPYLENE**
	: ALB	**BIPOLAR**
	: ALT	**HIGH TEMPERATURE**
	: ALR	**HIGH RIPPLE**

The components identified by shading and ⚠ symbol are critical for safety. Replace only with part number specified.

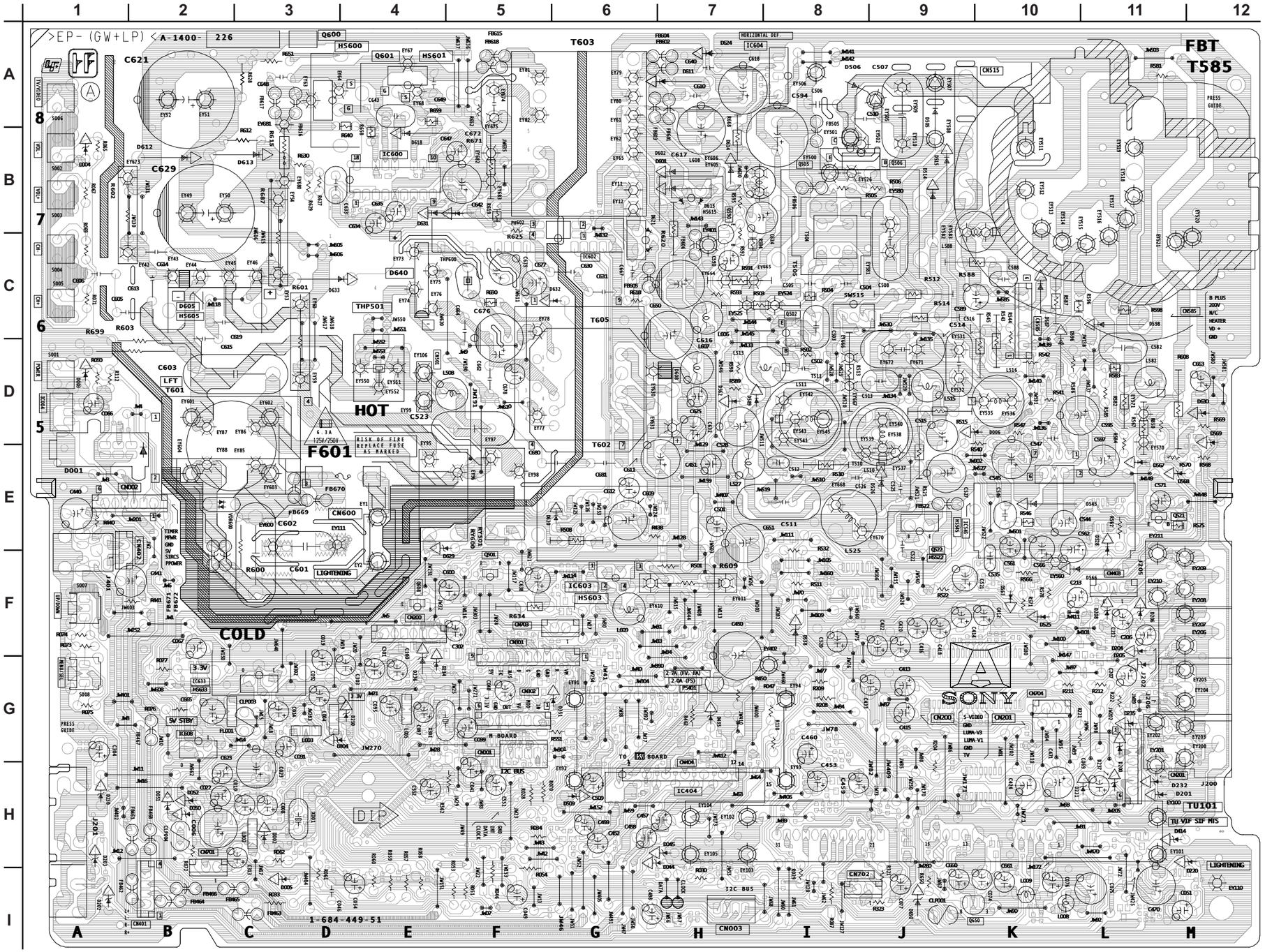
The symbol ▬ indicates a fast operating fuse and is displayed on the component side of the board. Replace only with fuse of the same rating as marked.


Tuner
S REAR
FRONT
YUV
YUV AUDIO
AUDIO OUT
V1
L
R
V2
Y
U
V
Y/C
Audio Amplifier
AN7522 7.5W
AN1725 10W
AudioProcessor
NJW1134
Det-Out
I2C Bus
RGB Driver
TDA6108
RGB
Speakers
I.R.
L.E.D.
Menu
CTRL
One-ChipIC
M65582MF-XXXFP
-Micro
-YCJ
-3LCombFilter
V-Out
TDA8172
Vd
Hp
E/W
H.Drive
Head
phones
Vert.
Energy Star
5V
STBY
3.3V
Reg.
9V
Reg.
5VDC
TV-8
DEC
Rect.
Power Mosfet
2SK2876
SRT
B+
Rect.
135V
Low B
Rect.
12.5V
Audio
Rect.
14V
Power Supply
Pin
Out
KC4370A
H-Out
2SD2627
Horiz.
To DY
To CRT
200v
Rect.
+13v
Rect.
-13v
Rect.
OCP
FBT
To CRT
G2
HV
Focus
L.F.T
Relay
AC Line
D.G.C.

A BOARD SCHEMATIC DIAGRAM



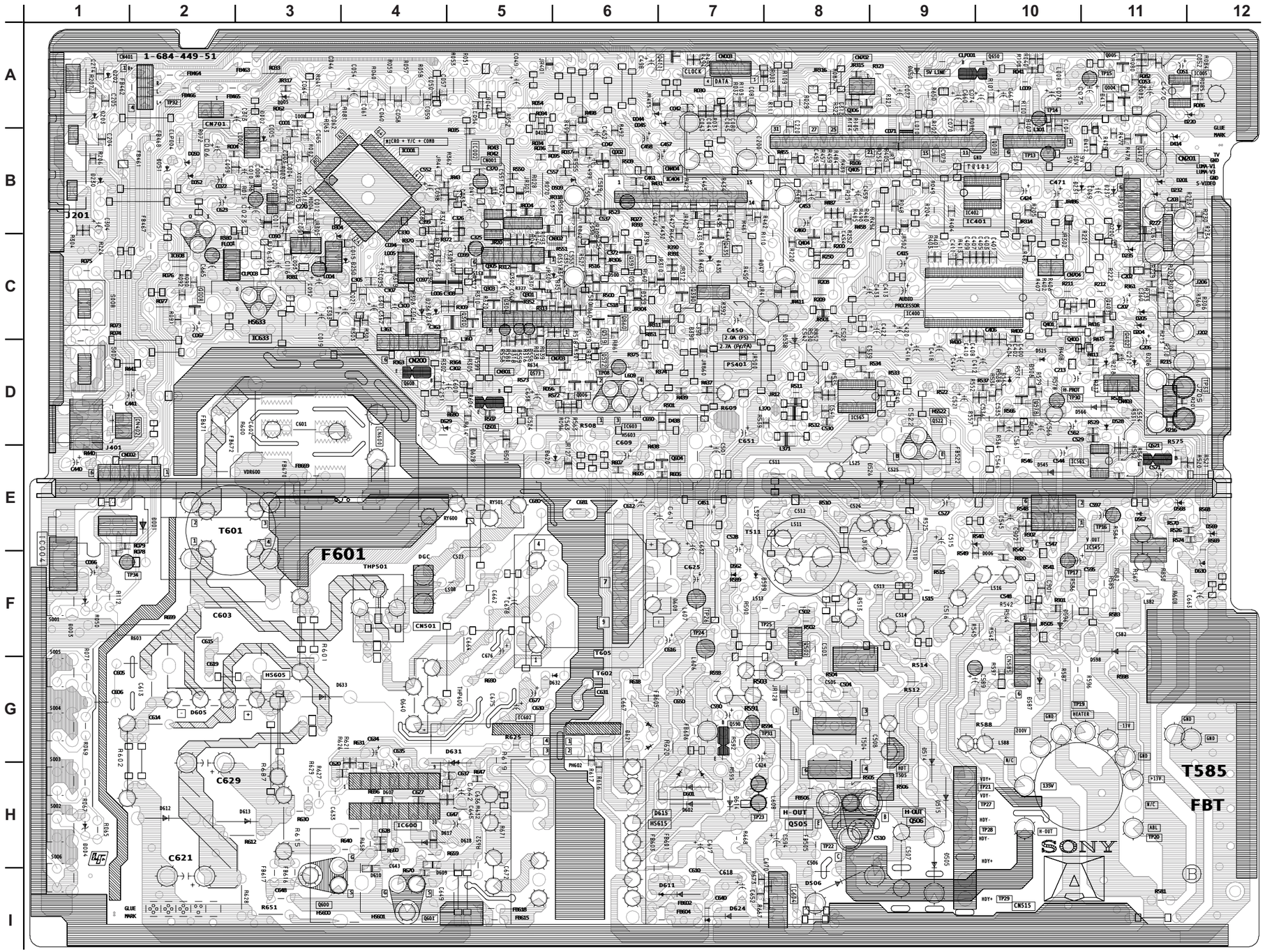
A [POWER SUPPLY, DEFLECTION, TUNER/IF, AUDIO, MTS, TUNING CONTROL, Y-C JUNGLE] (COMPONENT SIDE)



A BOARD LOCATOR TABLE

DIODE			DIODE			TRANSISTORS		
	A	B		A	B		A	B
D002	H-3	--	D528	--	D-11	Q002	--	B-6
D003	D-1	--	D545	--	E-10	Q004	--	A-11
D004	B-1	--	D558	--	D-5	Q005	--	A-11
D005	I-3	--	D559	--	C-6	Q006	--	D-6
D006	D-10	--	D562	--	F-7	Q008	--	C-2
D044	H-7	--	D563	F-10	--	Q009	--	B-10
D045	H-7	--	D566	--	D-11	Q300	--	C-5
D050	H-2	--	D567	--	E-11	Q301	--	C-5
D051	H-2	--	D568	--	E-11	Q303	--	C-5
D052	H-2	--	D569	--	E-11	Q304	--	C-5
D200	H-11	--	D587	C-10	--	Q305	--	C-5
D201	H-11	--	D589	--	F-7	Q306	--	A-8
D202	I-1	--	D596	C-10	--	Q390	--	C-7
D203	H-11	--	D598	C-11	--	Q391	--	C-6
D204	F-11	--	D605	C-2	--	Q400	--	D-10
D205	F-11	--	D608	D-7	--	Q401	--	D-10
D206	F-11	--	D611	A-7	--	Q411	--	A-6
D208	F-11	--	D614	B-7	--	Q412	--	B-11
D230	H-1	--	D615	B-7	--	Q435	--	C-7
D231	H-10	--	D618	B-4	--	Q501	F-5	--
D232	H-11	--	D621	B-6	--	Q502	C-8	--
D234	G-4	--	D624	A-7	--	Q506	B-9	--
D235	G-11	--	D628	--	E-5	Q521	E-11	--
D236	G-4	--	D629	F-5	--	Q522	F-9	--
D237	H-11	--	D630	D-12	--	Q572	--	D-5
D351	G-6	--	D631	B-4	--	Q573	--	D-5
D390	--	C-7	D650	I-9	--	Q578	--	D-10
D410	--	B-5	IC			Q590	--	G-7
D412	--	B-11		A	B	Q600	--	I-3
D413	--	A-11	IC001	--	B-4	Q601	--	I-4
D414	--	B-11	IC002	--	C-5	Q604	--	E-7
D435	G-7	--	IC003	--	B-3	Q608	--	D-4
D438	--	D-7	IC400	--	C-9	Q650	--	A-10
D501	--	E-5	IC545	E-9	--			
D505	--	I-9	IC561	--	E-10			
D506	--	I-8	IC565	--	D-8			
D508	--	D-10	IC600	--	H-4			
D509	--	B-6	IC603	--	D-6			
D514	--	G-9	IC604	A-7	--			
D515	--	H-9	IC608	G-2	--			
D525	--	D-10	IC633	G-2	--			
D526	--	E-8						

A [POWER SUPPLY, DEFLECTION, TUNER/IF, AUDIO, MTS, TUNING CONTROL, Y-C JUNGLE] [CONDUCTOR SIDE)



A BOARD LOCATOR TABLE

DIODE			DIODE			TRANSISTORS		
	A	B		A	B		A	B
D002	H-3	--	D528	--	D-11	Q002	--	B-6
D003	D-1	--	D545	--	E-10	Q004	--	A-11
D004	B-1	--	D558	--	D-5	Q005	--	A-11
D005	I-3	--	D559	--	C-6	Q006	--	D-6
D006	D-10	--	D562	--	F-7	Q008	--	C-2
D044	H-7	--	D563	F-10	--	Q009	--	B-10
D045	H-7	--	D566	--	D-11	Q300	--	C-5
D050	H-2	--	D567	--	E-11	Q301	--	C-5
D051	H-2	--	D568	--	E-11	Q303	--	C-5
D052	H-2	--	D569	--	E-11	Q304	--	C-5
D200	H-11	--	D587	C-10	--	Q305	--	C-5
D201	H-11	--	D589	--	F-7	Q306	--	A-8
D202	I-1	--	D596	C-10	--	Q390	--	C-7
D203	H-11	--	D598	C-11	--	Q391	--	C-6
D204	F-11	--	D605	C-2	--	Q400	--	D-10
D205	F-11	--	D608	D-7	--	Q401	--	D-10
D206	F-11	--	D611	A-7	--	Q411	--	A-6
D208	F-11	--	D614	B-7	--	Q412	--	B-11
D230	H-1	--	D615	B-7	--	Q435	--	C-7
D231	H-10	--	D618	B-4	--	Q501	F-5	--
D232	H-11	--	D621	B-6	--	Q502	C-8	--
D234	G-4	--	D624	A-7	--	Q506	B-9	--
D235	G-11	--	D628	--	E-5	Q521	E-11	--
D236	G-4	--	D629	F-5	--	Q522	F-9	--
D237	H-11	--	D630	D-12	--	Q572	--	D-5
D351	G-6	--	D631	B-4	--	Q573	--	D-5
D390	--	C-7	D650	I-9	--	Q578	--	D-10
D410	--	B-5	IC			Q590	--	G-7
D412	--	B-11		A	B	Q600	--	I-3
D413	--	A-11	IC001	--	B-4	Q601	--	I-4
D414	--	B-11	IC002	--	C-5	Q604	--	E-7
D435	G-7	--	IC003	--	B-3	Q608	--	D-4
D438	--	D-7	IC400	--	C-9	Q650	--	A-10
D501	--	E-5	IC545	E-9	--			
D505	--	I-9	IC561	--	E-10			
D506	--	I-8	IC565	--	D-8			
D508	--	D-10	IC600	--	H-4			
D509	--	B-6	IC603	--	D-6			
D514	--	G-9	IC604	A-7	--			
D515	--	H-9	IC608	G-2	--			
D525	--	D-10	IC633	G-2	--			
D526	--	E-8						

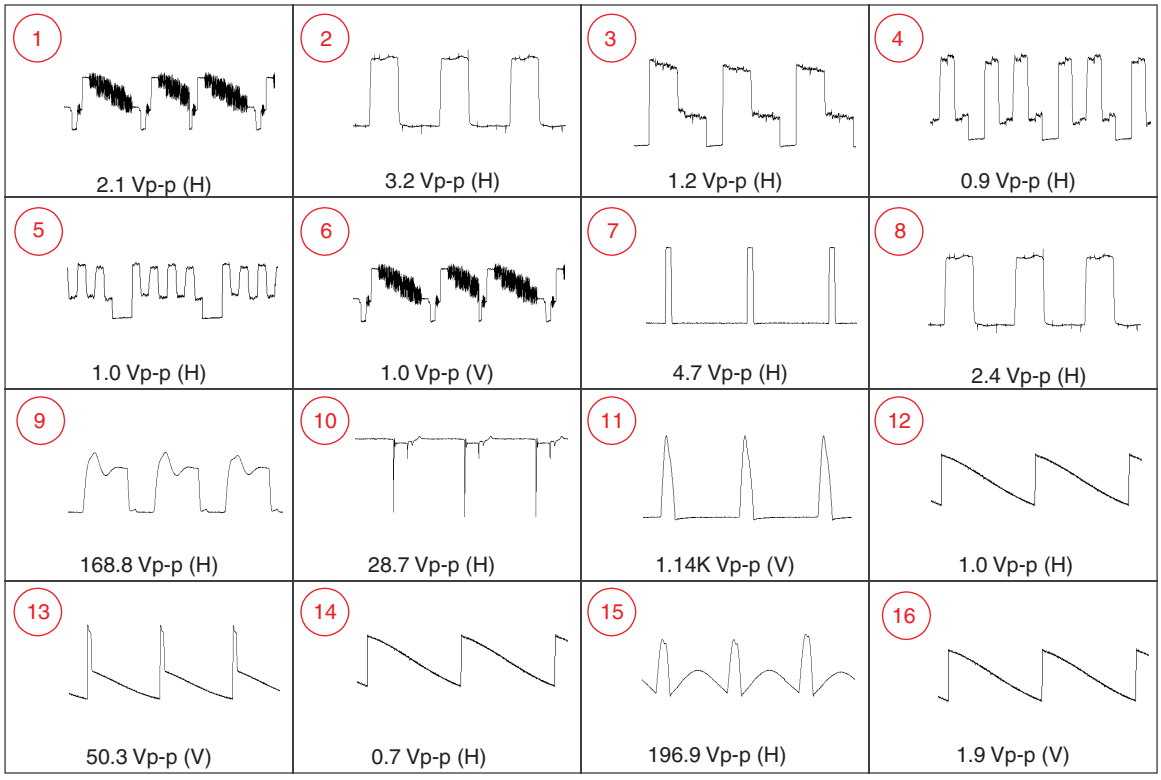
A BOARD TRANSISTOR VOLTAGE LIST

	B	C	E		B	C	E
Q002	0.0	2.0	GND	**Q411**	0.0	5.8	GND
Q004	3.8	9.0	4.4	**Q412**	0.1	0.1	GND
Q005	5.1	0.8	5.0	**Q435**	0.0	GND	5.8
Q006	0.0	0.0	GND	**Q501**	0.0	14.3	GND
Q008	0.0	2.6	GND	**Q502**	0.0	74.1	GND
Q009	0.0	5.2	GND	**Q505**	0.0	131.8	0.0
Q300	1.8	9.0	2.4	**Q506**	0	131.8	0
Q301	3.6	2.1	3.6	**Q521**	0.0	3.8	GND
Q303	3.6	GND	2.8	**Q522**	0.1	-2.1	0.0
Q304	3.6	GND	2.9	**Q572**	0.0	2.6	GND
Q305	3.6	GND	3.0	**Q573**	2.6	0.0	2.6
Q306	5.5	GND	4.9	**Q578**	0.0	0.5	GND
Q390	0.8	1.5	1.9	**Q590**	133.7	0.0	134.2
Q391	0.6	3.3	1.5	**Q604**	30.6	11.6	30.2
Q400	0.0	0.1	GND	**Q608**	0.0	6.7	GND
Q401	0.0	0.1	GND	**Q650**	5.8	9.0	5.0

All voltages are in V.

	D	G	S
Q600	157.8	0.0	-4.4
Q601	-4.4	4.6	0.0

A BOARD WAVEFORMS



A BOARD IC VOLTAGE LIST

IC001	
PIN	**VOLT**
1	N/C
2	GND
3	2.2
4	2.2
5	GND
6	5.0
7	0.0
8	2.0
9	0.3
10	2.1
11	5.0
12	GND
13	3.3
14	3.1
15	1.0
16	1.5
17	3.3
18	0.5
19	1.1
20	GND
21	0.5
22	1.7
23	0.5
24	0.5
25	0.5
26	0.0
27	0.0
28	2.1
29	2.7
30	3.3
31	2.9
32	GND
33	2.8
34	3.3
35	2.9
36	GND
37	1.8
38	0.0
39	0.1
40	2.0
41	1.6
42	3.3
43	N/C
44	1.6
45	1.6
46	2.3
47	1.0
48	N/C
49	0.5
50	1.2
51	2.0
52	1.5
53	4.8
54	4.8
55	4.8
56	4.8
57	N/C
58	5.2
59	0.0
60	0.0
61	0.0
62	0.0
63	1.4
64	4.9
65	4.9
66	0.0
67	0.1
68	0.1
69	2.4
70	5.0
71	5.0
72	0.1
73	0.0
74	5.0
75	5.0
76	5.0
77	0.1
78	0.0
79	4.9
80	4.9

IC002	
PIN	**VOLT**
1	GND
2	GND
3	GND
4	GND
5	N/C
6	N/C
7	GND
8	4.5
9	4.5
10	4.5
11	4.5
12	4.5
13	4.5
14	4.5
15	4.5
16	4.5
17	4.5
18	4.5
19	4.5
20	GND
21	**9**
22	4.5
23	3.8
24	3.9
25	3.9
26	0.6
27	4.5
28	4.5
29	4.5
30	4.5
31	4.5
32	4.5
33	4.5
34	N/C

IC003	
PIN	**VOLT**
1	N/C
2	GND
3	GND
4	5.0
5	5.0

IC400	
PIN	**VOLT**
1	4.5
2	4.5
3	4.5
4	4.5
5	N/C
6	N/C
7	N/C
8	4.5
9	4.5
10	4.5
11	4.5
12	4.5
13	4.5
14	4.5
15	4.5
16	4.5
17	3.5
18	3.5
19	4.8
20	4.8
21	4.5
22	4.5
23	4.5
24	4.5
25	4.5
26	4.5
27	4.5
28	4.5
29	4.5
30	4.5
31	4.5
32	4.5
33	4.5
34	N/C

IC545	
PIN	**VOLT**
1	0.7
2	13.5
3	-12.2
4	-13.3
5	0.2
6	13.8
7	0.7

IC561	
PIN	**VOLT**
1	0.1
2	3.4
3	2.3
4	GND
5	9.2
6	10.2
7	0.1
8	13.5

IC565	
PIN	**VOLT**
1	3.4
2	3.4
3	2.1
4	9.0
5	1.0
6	1.0
7	1.0
8	1.6
9	1.6
10	1.6
11	GND
12	1.6
13	1.6
14	1.6

IC600	
PIN	**VOLT**
1	2.5
2	1.8
3	2.2
4	2.5
5	GND
6	0.0
7	4.0
8	17.2
9	GND
10	10.4
11	0.0
12	4.6
13	N/C
14	163.6
15	153.5
16	157.6
17	N/C
18	1.7

IC603	
PIN	**VOLT**
I	12.0
G	GND
O	9.0

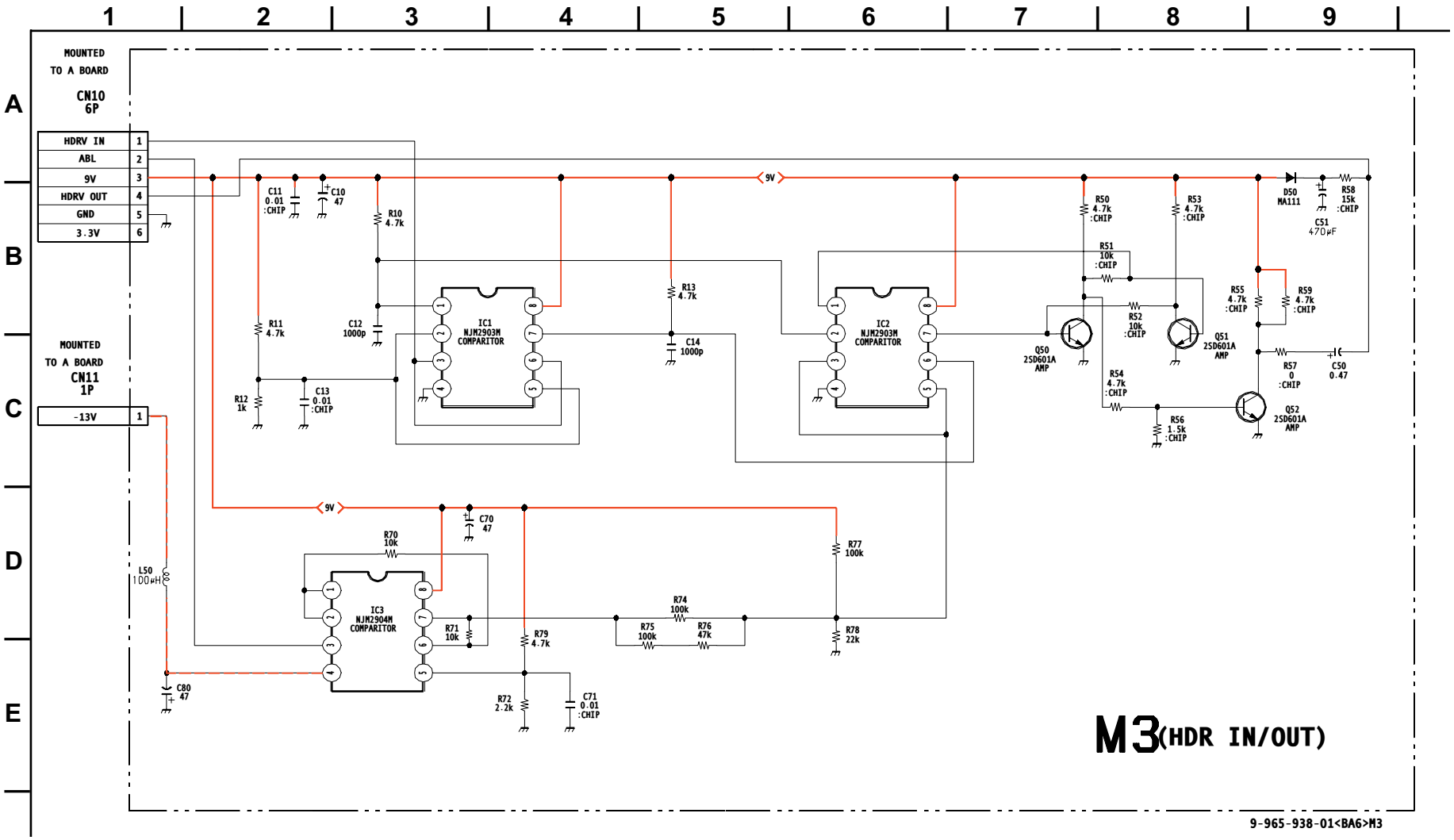
IC604	
PIN	**VOLT**
1	133.7
2	N/C
3	2.5
4	11.3
5	GND

IC608	
PIN	**VOLT**
I	11.0
O	5.0
G	GND

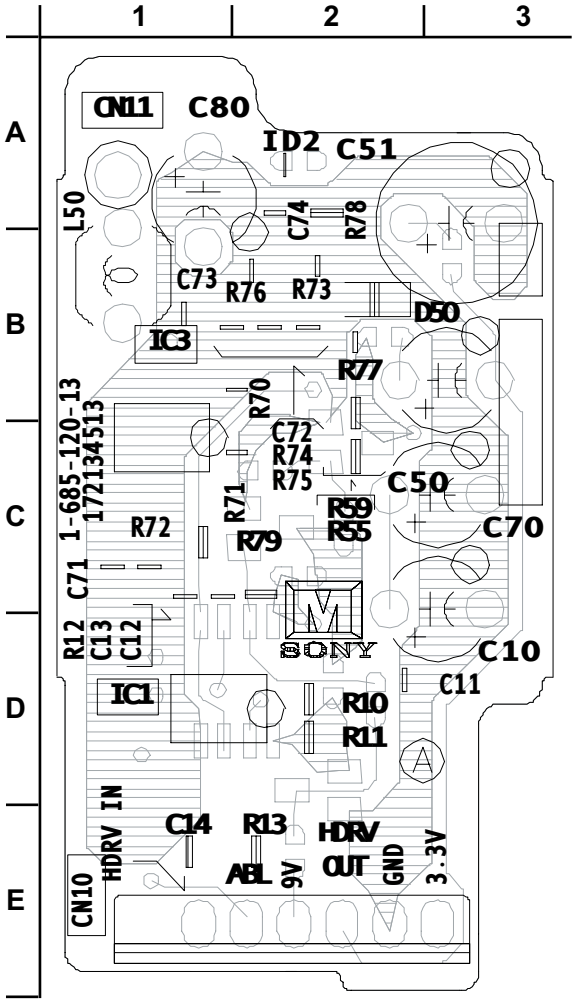
IC633	
PIN	**VOLT**
I	9.0
G	GND
O	3.3

All voltages are in V.

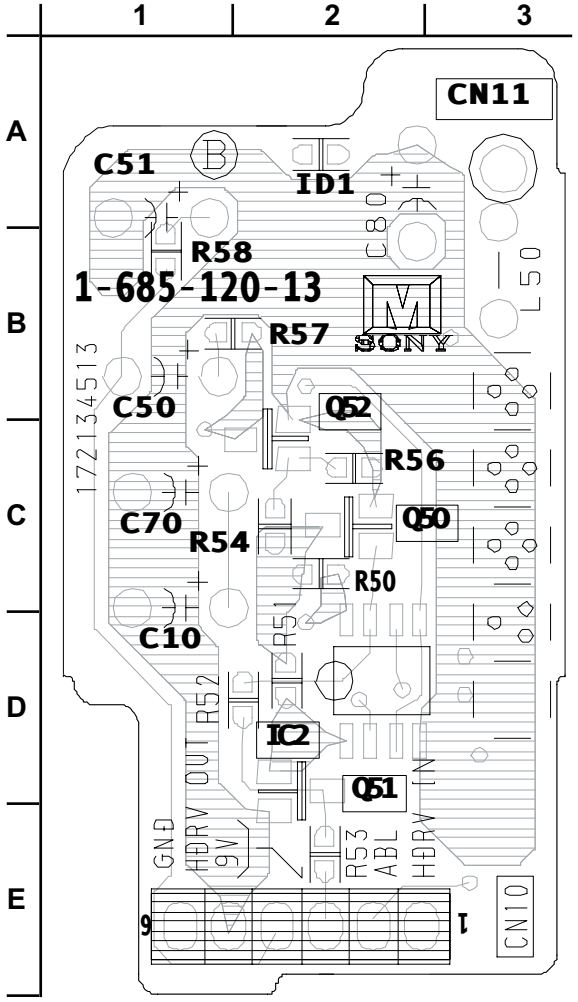
M3 BOARD SCHEMATIC DIAGRAM



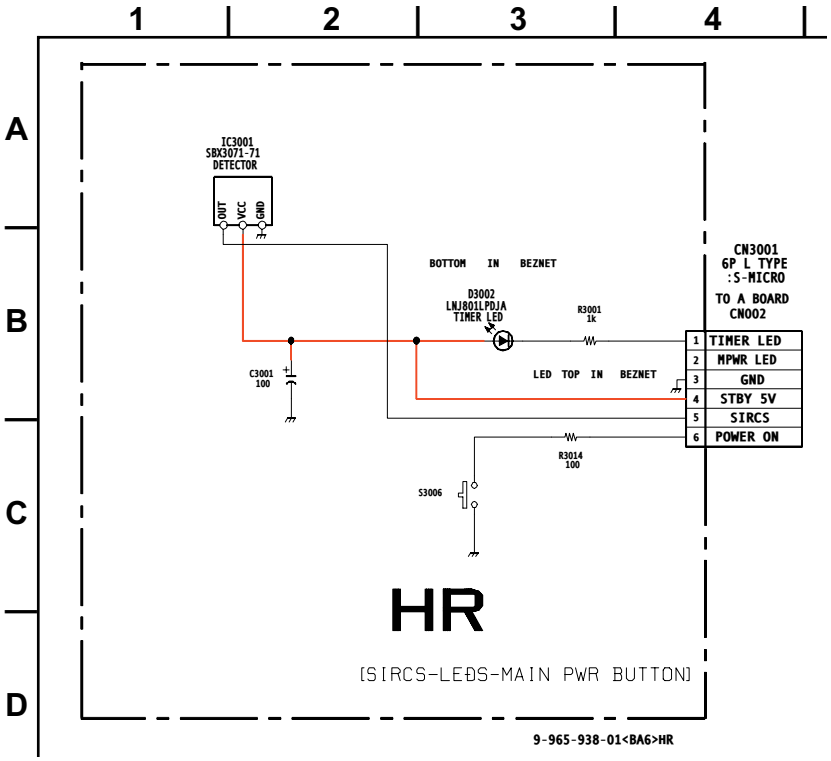
M3 [HDR IN/OUT] [COMPONENT SIDE]



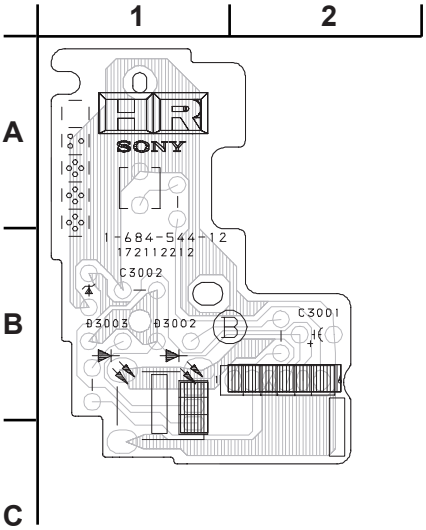
M3 [HDR IN/OUT] [CONDUCTOR SIDE]



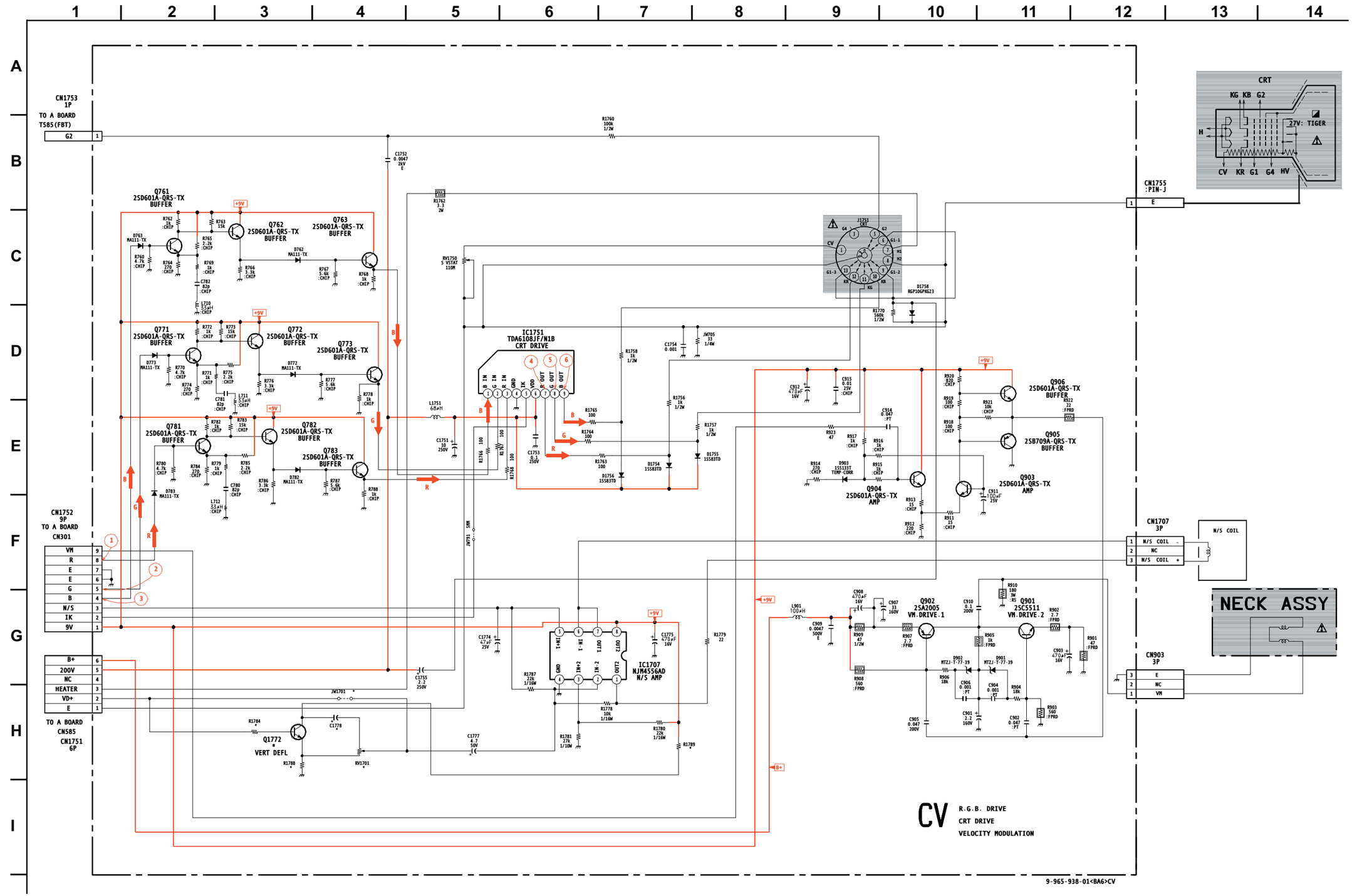
HR BOARD SCHEMATIC DIAGRAM



HR [MAIN PWR BUTTON, SIRCS, LEDS]



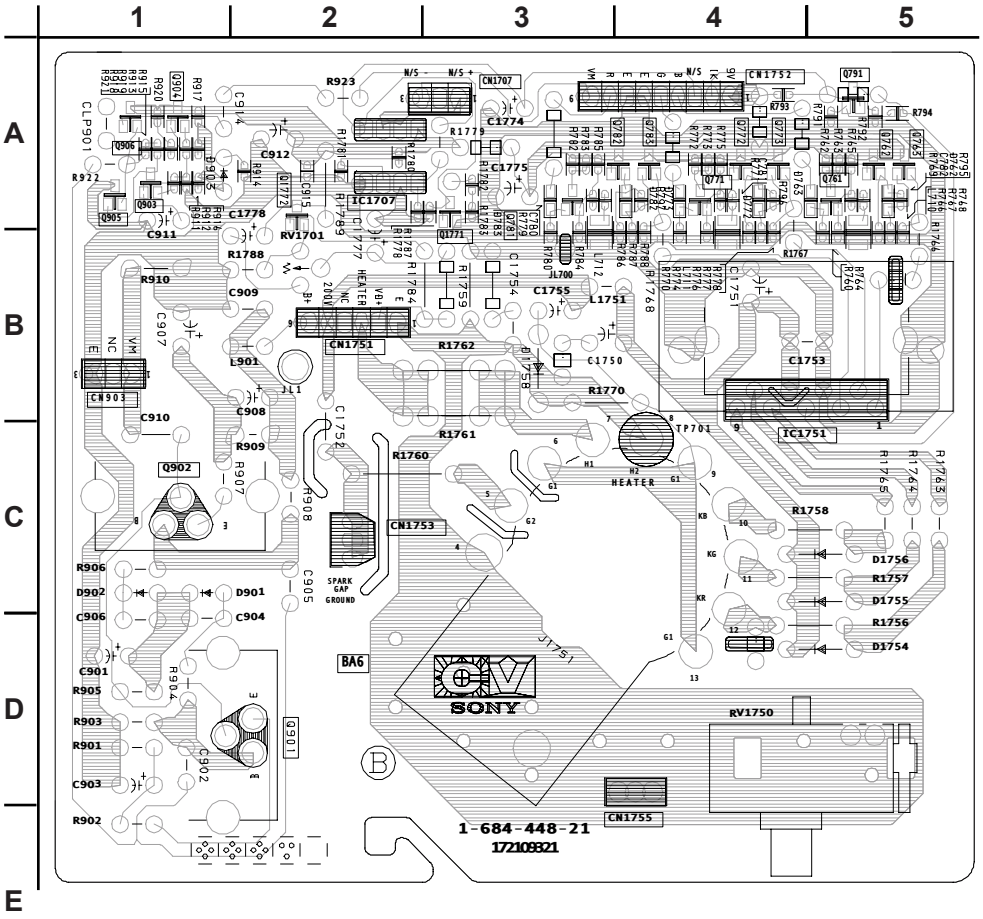
CV BOARD SCHEMATIC DIAGRAM



CV BOARD WAVEFORMS

1 1.3V p-p (H)	2 1.2V p-p (H)	3 1.0V p-p (H)
4 145.3V p-p (H)	5 117.0V p-p (H)	6 120.3V p-p (H)

CV [RGB DRIVE, CRT DRIVE, VELOCITY MODULATION]



CV BOARD IC VOLTAGE TABLE

IC1707	
PIN	VOLT
1	1.8
2	2.8
3	4.4
4	GND
5	4.8
6	4.8
7	4.8
8	9.0
IC1751	
PIN	VOLT
1	2.0
2	2.0
3	2.4
4	GND
5	3.7
6	200.0
7	136.0
8	142.0
9	140.0

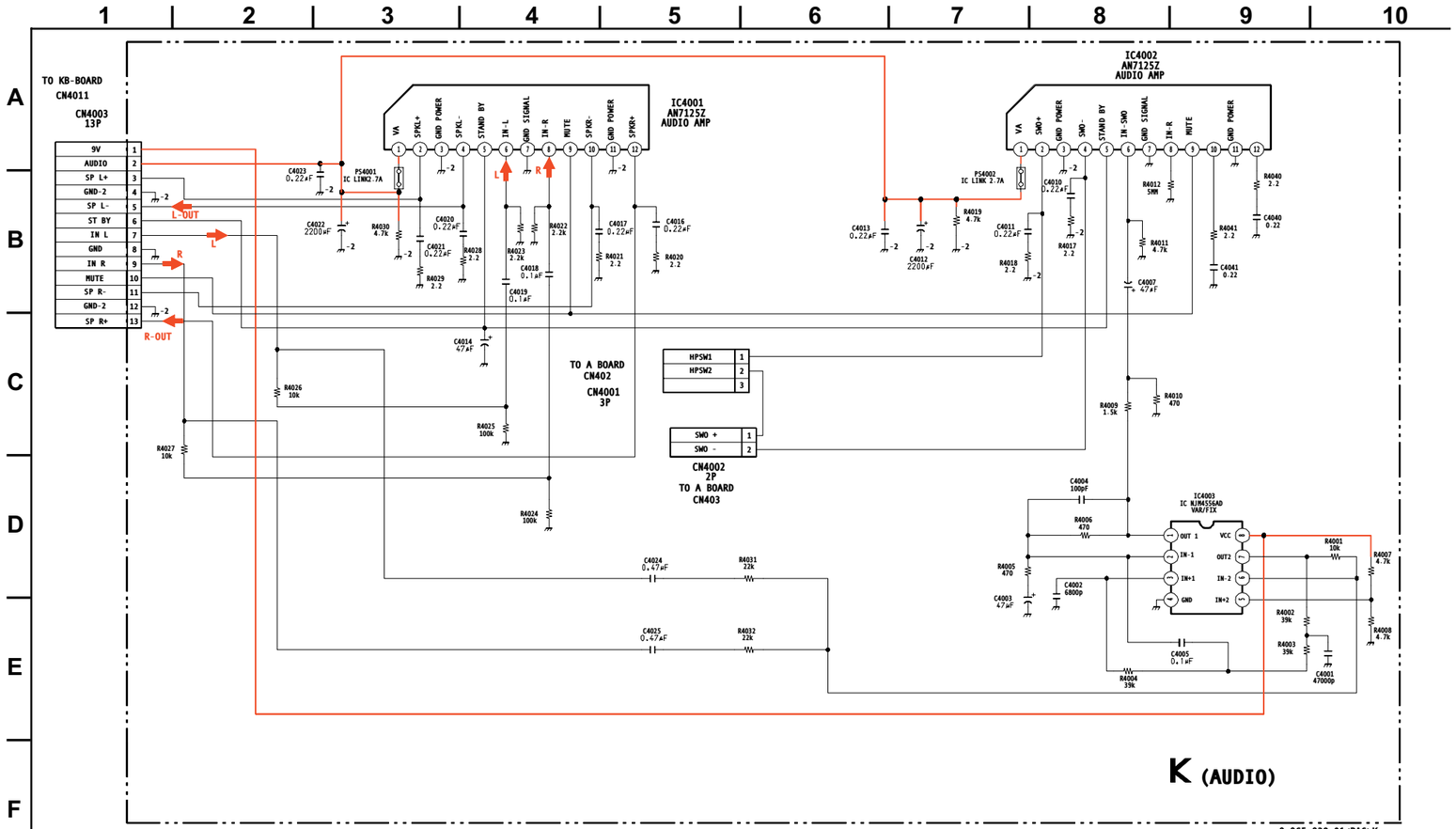
All voltages are in V.

CV BOARD TRANSISTOR VOLTAGE LIST

	B	C	E		B	C	E
Q761	2.2	3.8	2.9	**Q783**	2.1	9.0	2.7
Q762	3.1	9.0	3.8	**Q901**	0.9	67.0	0.4
Q763	2.0	9.0	2.6	**Q902**	134.0	67.0	134.0
Q771	2.2	3.8	2.9	**Q903**	1.8	5.4	2.4
Q772	3.2	9.0	3.8	**Q904**	1.8	9.0	2.4
Q773	2.0	9.0	2.6	**Q905**	5.7	GND	5.4
Q781	2.2	3.9	2.9	**Q906**	5.7	9.0	6.1
Q782	3.3	9.0	3.9	**Q1772**	0.0	0.0	0.0

All voltages are in V.

K BOARD SCHEMATIC DIAGRAM

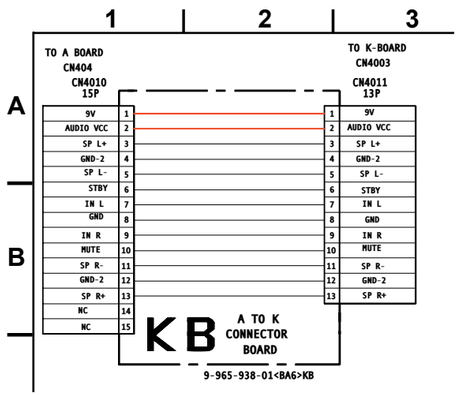


K BOARD IC VOLTAGE LIST

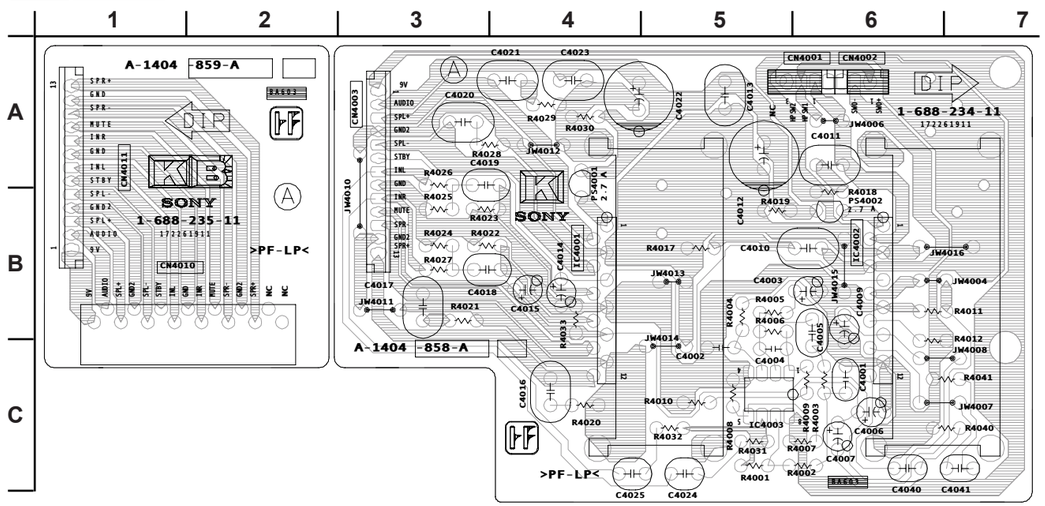
IC4001		IC4002		IC4003	
PIN	VOLT	PIN	VOLT	PIN	VOLT
1	14.6	1	14.6	1	4.5
2	7.0	2	7.0	2	4.5
3	GND	3	GND	3	4.5
4	7.0	4	7.0	4	GND
5	5.9	5	5.9	5	4.5
6	0.0	6	0.0	6	4.5
7	GND	7	GND	7	4.5
8	0.0	8	0.0	8	9.0
9	0.5	9	0.5		
10	7.2	10	7.2		
11	GND	11	GND		
12	7	12	7		

All voltages are in V.

KB BOARD SCHEMATIC DIAGRAM

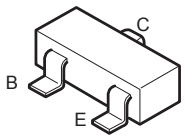


K KB [AUDIO]

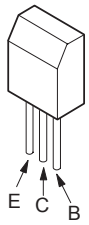


5-4. SEMICONDUCTORS

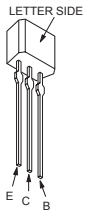
2SB709A-QRS-TX
2SD601A-QRS-TX



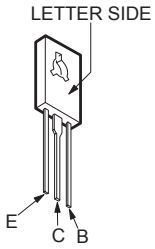
2SB734-T-34
2SC3209LK-TP



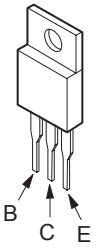
2SA1309A-QRSTA
2SC3311A-QRSTA
2SD2144S-TP-UVW



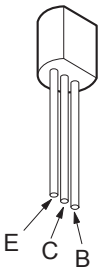
2SC3840K



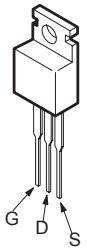
2SA1837



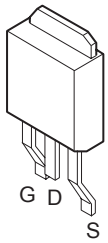
2SA1091O-TPE2



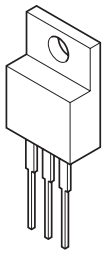
IRF614



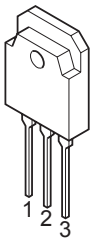
2SK2663



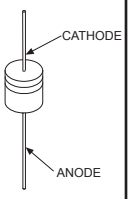
2SC4793



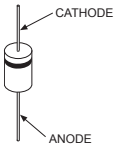
2SD2578-YB



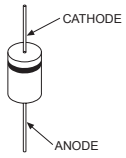
ERA38-06TP1
ERA82-004TP5
1SS133T-77
D1NS0R-TA
MTZJ-T-77-12C
MTZJ-T-77-15B
MTZJ-T-77-33B
MTZJ-T-77-39



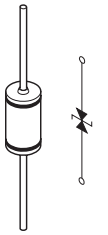
RU-1P
ERC06-15S
EGP20DPKG23
MTZJ-T-77-5.1C
MTZJ-T-77-5.6C
MTZJ-T-77-7.5A
MTZJ-T-77-10B
MTZJ-T-77-30D
RGP10-GPKG3
RGP02-17PKG23
RGP15GPKG23



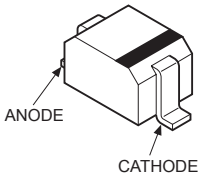
ERB44-06TP1
1SS83TD
GP08DPKG23
RGP10GPKG23
RU4AM-T3



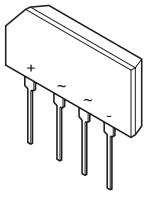
RD9.1EW-T1



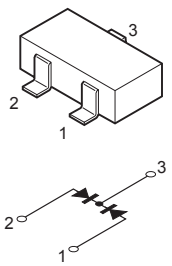
MA111-TX
UDZ-TE-17.5.1B UDZ-TE-17.91B



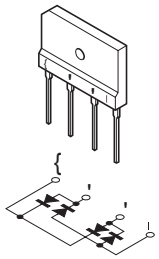
D2SB60A-F04



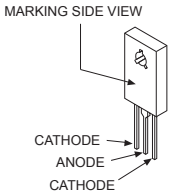
DAP202K-T-146



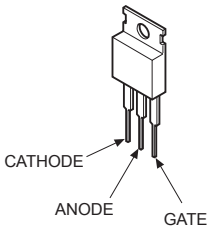
D4SB60L-F



D5LC20U



TF541M



SECTION 6: EXPLODED VIEWS

Components not identified by a part number or description are not stocked because they are seldom required for routine service.

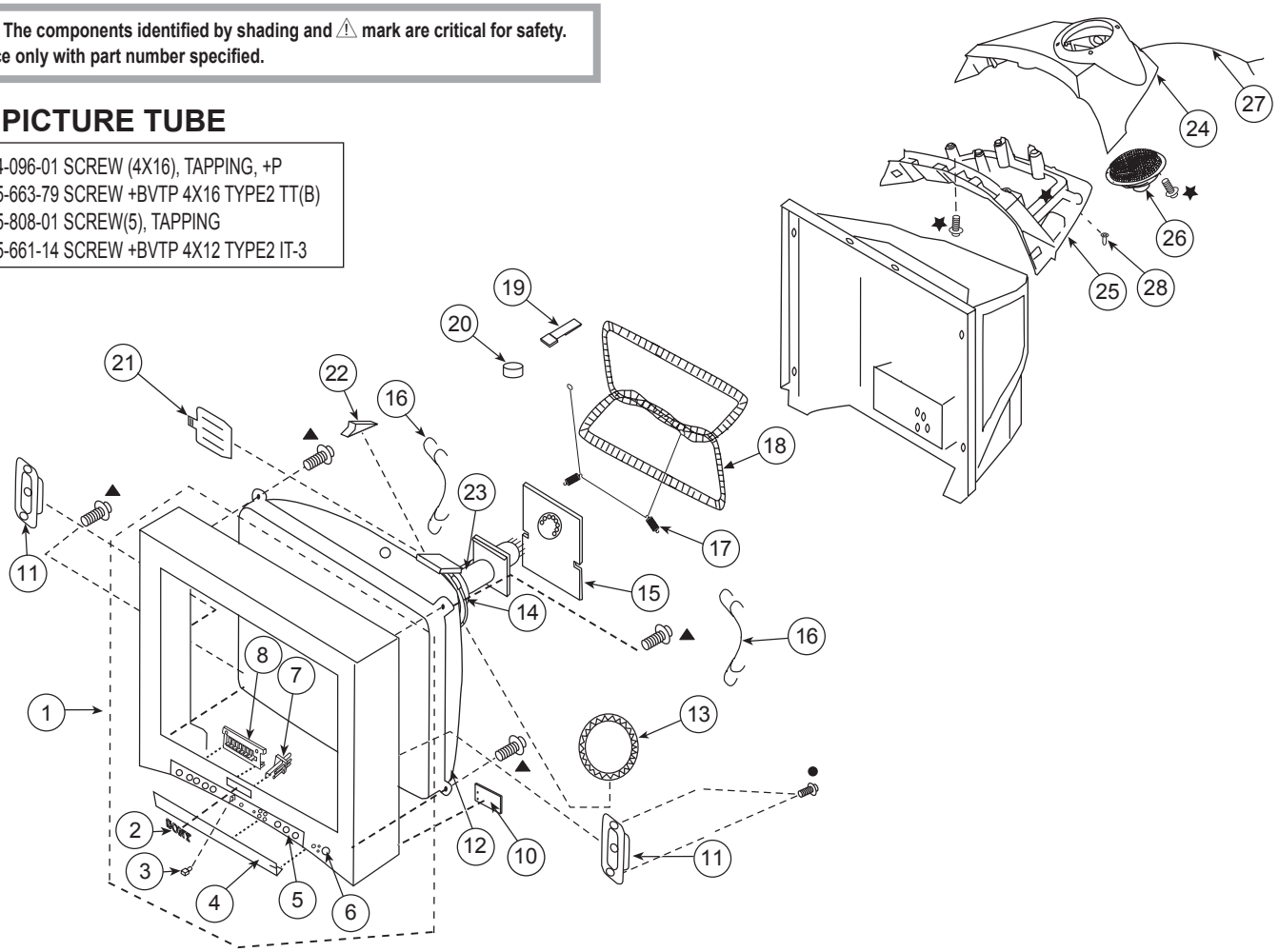
The component parts of an assembly are indicated by the reference numbers in the far right column of the parts list and within the dotted lines of the diagram.

*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

6-1. PICTURE TUBE

● 4-384-096-01 SCREW (4X16), TAPPING, +P
■ 7-685-663-79 SCREW +BVTP 4X16 TYPE2 TT(B)
▲ 4-365-808-01 SCREW(5), TAPPING
★ 7-685-661-14 SCREW +BVTP 4X12 TYPE2 IT-3



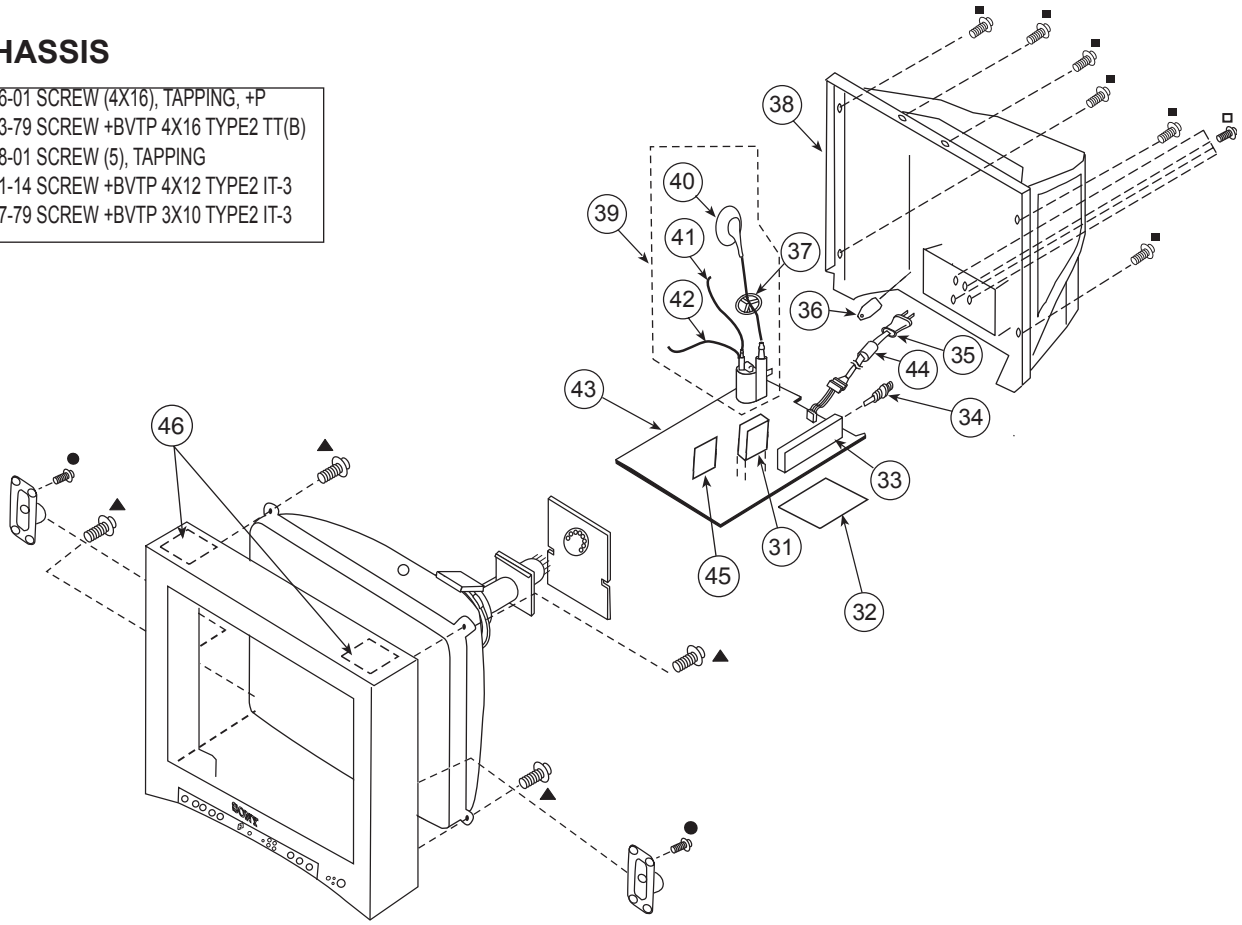
REF. NO.	PART NO.	DESCRIPTION	[Assembly Includes]
1	X-4039-877-3	BEZNET ASSY	(2-8)
2	4-046-161-11	EMBLEM, SONY NO.8	
3	4-042-192-01	CATCHER, PUSH	
4	4-087-155-11	DOOR, CONTROL	
5	4-074-895-71	LABEL, FRONT TERMINAL (20)	
6	4-087-150-01	BUTTON, POWER	
7	4-087-156-01	GUIDE, LIGHT	
8	4-087-151-01	BUTTON, MULTI	
* 10	A-1400-251-A	HR (COM) BOARD, MOUNTED	
11	1-825-425-11	LOUDSPEAKER 19.2CM 10W 8 OHMS	
⚠ 12	8-738-831-05	CRT 21RSN(SDP) (A51LPT50X)(LATIN NORTH ONLY)	
⚠ 12	8-738-838-05	CRT 21RSN(SDP)(SOUTH) (A51LPT50X) (LATIN SOUTH ONLY)	
⚠ 13	1-452-728-61	COIL, NA ROTATION (RT-154) (LATIN SOUTH ONLY)	
⚠ 13	1-456-285-11	NA ROTATION COIL (RT-A54) (LATIN NORTH ONLY)	
⚠ 14	8-451-505-71	DY Y21RSA-V	
* 15	A-1400-223-A	CV (VAR) BOARD, MOUNTED (LATIN NORTH ONLY)	
* 15	A-1400-981-A	CV (VAR) BOARD, MOUNTED (LATIN SOUTH ONLY)	
* 16	4-080-810-21	BAND, DEGAUSS COIL	

REF. NO.	PART NO.	DESCRIPTION
* 17	4-375-394-01	SPRING, TENSION
⚠ 18	1-456-153-11	COIL, DEGAUSSING
19	4-083-414-01	PIECE A(110), CONV CORRECT
20	1-452-032-00	MAGNET,DISC
21	4-057-714-01	PIECE ASSY, TLH CORRECTION
22	4-053-005-01	SPACER, DY
⚠ 23	1-451-561-21	NECK ASSEMBLY
* 24	4-093-992-01	COVER, TOP WOOFER (21)
* 25	4-093-993-01	COVER, BOTTOM WOOFER (21)
26	1-825-424-11	LOUDSPEAKER 10CM 10W 4 OHMS
* 27	1-827-198-11	CONNECTION CABLE
* 28	4-068-528-01	FOOT

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

6-2. CHASSIS

● 4-384-096-01 SCREW (4X16), TAPPING, +P
■ 7-685-663-79 SCREW +BVTP 4X16 TYPE2 TT(B)
▲ 4-365-808-01 SCREW (5), TAPPING
★ 7-685-661-14 SCREW +BVTP 4X12 TYPE2 IT-3
◘ 7-685-647-79 SCREW +BVTP 3X10 TYPE2 IT-3



	REF. NO.	PART NO.	DESCRIPTION [Assembly Includes]
	31	A-1404-859-A	KB BOARD, MOUNTED
*	32	A-1404-858-A	K BOARD, MOUNTED
⚠	33	8-598-593-50	TUNER FSS BTF-WA421
⚠	34	1-766-374-11	PLUG, F-PIN
⚠	35	1-824-069-11	CORD, AC POWER(WITH CONNECTOR) (LATIN NORTH ONLY)
⚠	35	1-757-840-12	CORD, POWER (WITH CONNECTOR) (LATIN SOUTH ONLY)
*	36	4-081-980-11	HOLDER, AC CABLE
	37	4-084-918-01	HOLDER, HV CABLE
	38	4-087-153-02	COVER, REAR
⚠	39	1-453-316-21	FBT ASSY NX-1748//X4A4 (40-42)
⚠	40	1-251-642-52	CAP ASSY, HIGH-VOLTAGE
⚠	41	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD
⚠	42	1-900-803-22	WIRE ASSY, G2 LEAD

	REF. NO.	PART NO.	DESCRIPTION
	43	A-1302-090-A	A BOARD,COMPLETE (LATIN NORTH ONLY)
*	43	A-1302-094-A	A BOARD,COMPLETE (LATIN SOUTH ONLY)
			The high-voltage leads associated with the FBT on this A Board are not included and must be ordered separately (See 40-42)
	44	1-500-586-11	FILTER, CLAMP (FERRITE CORE) (LATIN SOUTH ONLY)
*	45	A-1400-738-A	M3 (VAR) BOARD, MOUNTED
	46	4-089-108-01	DAMPER, SOUND

SECTION 7: ELECTRICAL PARTS LIST

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

The components in this manual identified by the following symbol: ⋈ indicate parts that have been carefully factory-selected to satisfy regulations regarding X-ray radiation for each set.

Should replacement be required for one of these components, replace only with the value originally used.

RESISTORS

- **All resistors are in ohms**
- **F : nonflammable**
- **All variable and adjustable resistors have characteristic curve B, unless otherwise noted.**

When ordering parts by reference number, please include the board name.

REF. NO.	PART NO.	DESCRIPTION	VALUES
A			
*	A-1302-090-A	A BOARD, COMPLETE (LATIN NORTH ONLY)	
*	A-1302-094-A	A BOARD, COMPLETE (LATIN SOUTH ONLY)	
⚠	1-533-223-11	FUSE HOLDER	
	4-382-854-11	SCREW (M3X10), P, SW (+)	

The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. Order the following leads when requesting this A Board:

⚠	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠	1-900-803-22	WIRE ASSY, G2 LEAD	
⚠	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	

CAPACITOR

C003	1-162-919-11	CERAMIC CHIP	22pF	5%	50V
C004	1-162-923-11	CERAMIC CHIP	47pF	5%	50V
C005	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C006	1-126-942-61	ELECT	1000µF	20%	25V
C007	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C008	1-126-956-91	ELECT	0.1µF	20%	50V
C009	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C010	1-126-960-11	ELECT	1µF	20%	50V
C011	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C012	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C014	1-126-960-11	ELECT	1µF	20%	50V
C015	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C019	1-126-956-91	ELECT	0.1µF	20%	50V
C021	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C022	1-126-964-11	ELECT	10µF	20%	50V
C023	1-126-935-11	ELECT	470µF	20%	16V
C033	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C041	1-126-964-11	ELECT	10µF	20%	50V
C047	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C048	1-104-665-11	ELECT	100µF	20%	25V
C049	1-126-960-11	ELECT	1µF	20%	50V
C051	1-126-964-11	ELECT	10µF	20%	50V
C052	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C053	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C054	1-126-960-11	ELECT	1µF	20%	50V
C056	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C057	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C064	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C074	1-126-964-11	ELECT	10µF	20%	50V
C075	1-126-935-11	ELECT	470µF	20%	16V
C076	1-104-665-11	ELECT	100µF	20%	25V
C077	1-126-947-11	ELECT	47µF	20%	35V
C079	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C080	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C081	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C090	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C091	1-126-947-11	ELECT	47µF	20%	35V
C092	1-126-947-11	ELECT	47µF	20%	35V
C094	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C095	1-126-947-11	ELECT	47µF	20%	35V
C096	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C097	1-126-947-11	ELECT	47µF	20%	35V
C098	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C099	1-126-947-11	ELECT	47µF	20%	35V
C100	1-126-956-91	ELECT	0.1µF	20%	50V
C115	1-164-739-11	CERAMIC CHIP	560pF	5%	50V
C116	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C200	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C202	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C203	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C204	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C205	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C206	1-126-963-11	ELECT	4.7µF	20%	50V

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

A

REF. NO.	PART NO.	DESCRIPTION	VALUES		
C207	1-126-963-11	ELECT	4.7µF	20%	50V
C212	1-126-963-11	ELECT	4.7µF	20%	50V
C213	1-126-963-11	ELECT	4.7µF	20%	50V
C220	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C301	1-126-956-91	ELECT	0.1µF	20%	50V
C302	1-126-956-91	ELECT	0.1µF	20%	50V
C303	1-126-956-91	ELECT	0.1µF	20%	50V
C304	1-126-956-91	ELECT	0.1µF	20%	50V
C305	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C306	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C307	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C312	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C313	1-126-956-91	ELECT	0.1µF	20%	50V
C325	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C326	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C328	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C330	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C337	1-162-919-11	CERAMIC CHIP	22pF	5%	50V
C351	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C360	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C361	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C362	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C363	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C370	1-162-969-11	CERAMIC CHIP	0.0068µF	10%	25V
C390	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C400	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C401	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
C402	1-164-174-11	CERAMIC CHIP	0.0082µF	10%	25V
C403	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C404	1-162-967-11	CERAMIC CHIP	0.0033µF	10%	50V
C405	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
C406	1-164-677-11	CERAMIC CHIP	0.033µF	10%	16V
C407	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V
C408	1-162-965-11	CERAMIC CHIP	0.0015µF	10%	50V
C409	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C410	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
C411	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C412	1-126-960-11	ELECT	1µF	20%	50V
C413	1-126-960-11	ELECT	1µF	20%	50V
C414	1-126-961-11	ELECT	2.2µF	20%	50V
C415	1-126-960-11	ELECT	1µF	20%	50V
C416	1-126-960-11	ELECT	1µF	20%	50V
C418	1-126-963-11	ELECT	4.7µF	20%	50V
C420	1-126-960-11	ELECT	1µF	20%	50V

REF. NO.	PART NO.	DESCRIPTION	VALUES		
C422	1-126-960-11	ELECT	1µF	20%	50V
C440	1-126-940-11	ELECT	330µF	20%	25V
C441	1-126-940-11	ELECT	330µF	20%	25V
C470	1-126-935-11	ELECT	470µF	20%	16V
C498	1-126-960-11	ELECT	1µF	20%	50V
C499	1-126-963-11	ELECT	4.7µF	20%	50V
C502	1-102-112-00	CERAMIC	330pF	10%	50V
C503	1-106-383-00	MYLAR	0.047µF	10%	200V
C504	1-249-426-11	CARBON	5.6K	5%	1/4W
C505	1-102-002-00	CERAMIC	680pF	10%	500V
⚠ C506	1-117-214-11	CERAMIC	0.001µF	10%	2KV
⚠ C507	1-117-642-11	FILM	8200pF	3%	1.2KV
⚠ C508	1-129-722-00	FILM	0.047µF	5%	630V
C509	1-128-551-11	ELECT	22µF	20%	63V
C510	1-117-214-11	CERAMIC	0.001µF	10%	2KV
C511	1-115-521-11	FILM	0.82µF	5%	250V
C512	1-104-987-11	MYLAR	0.001µF	5%	200V
C513	1-106-383-00	MYLAR	0.047µF	10%	200V
C514	1-115-519-11	FILM	0.56µF	5%	250V
C515	1-107-651-11	ELECT	4.7µF	20%	250V
C520	1-126-965-91	ELECT	22µF	20%	50V
C521	1-126-960-11	ELECT	1µF	20%	50V
C522	1-162-117-00	CERAMIC	100pF	10%	500V
C523	1-136-346-51	MYLAR	0.22µF	20%	125V
	(LATIN NORTH ONLY)				
C523	1-136-346-61	MYLAR	0.22µF	20%	300V
	(LATIN SOUTH ONLY)				
C525	1-164-646-11	CERAMIC	2200pF	10%	500V
C526	1-102-244-00	CERAMIC	220pF	10%	500V
C527	1-107-645-11	ELECT	22µF	20%	200V
C529	1-164-690-91	CERAMIC CHIP	0.0022µF	5%	50V
C534	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C536	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C537	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C539	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C542	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C544	1-126-967-11	ELECT	47µF	20%	50V
C545	1-126-969-11	ELECT	220µF	20%	50V
C546	1-137-194-81	FILM	0.47µF	5%	50V
C551	1-126-960-11	ELECT	1µF	20%	50V
C552	1-126-964-11	ELECT	10µF	20%	50V
C553	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C554	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
⚠ C561	1-126-963-11	ELECT	4.7µF	20%	50V

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
⚠	C562	1-104-666-11	ELECT	220µF	20%	25V
	C563	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
⚠	C566	1-107-635-11	ELECT	4.7µF	20%	160V
	C571	1-104-665-11	ELECT	100µF	20%	25V
	C582	1-106-387-00	MYLAR	0.068µF	10%	200V
⚠	C588	1-108-417-91	MYLAR	0.0047µF	10%	200V
	C589	1-128-560-11	ELECT	22µF	20%	100V
⚠	C590	1-126-964-11	ELECT	10µF	20%	50V
	C594	1-123-024-21	ELECT	33µF		160V
	C595	1-104-666-11	ELECT	220µF	20%	25V
	C597	1-104-666-11	ELECT	220µF	20%	25V
	C600	1-126-964-11	ELECT	10µF	20%	50V
	C601	1-117-703-11 (LATIN SOUTH ONLY)	CERAMIC	0.0047µF	20%	250V
⚠	C602	1-136-311-51 (LATIN NORTH ONLY)	MYLAR	0.47µF	20%	125V
⚠	C602	1-136-311-61 (LATIN SOUTH ONLY)	MYLAR	0.47µF	20%	300V
⚠	C603	1-136-311-51 (LATIN NORTH ONLY)	MYLAR	0.47µF	20%	125V
⚠	C603	1-136-311-61 (LATIN SOUTH ONLY)	MYLAR	0.47µF	20%	300V
⚠	C605	1-127-793-51	CERAMIC	2200pF	20%	250V
⚠	C606	1-127-793-51	CERAMIC	2200pF	20%	250V
	C609	1-126-942-61	ELECT	1000µF	20%	25V
	C610	1-164-644-11	CERAMIC	330pF	10%	500V
	C611	1-126-971-11	ELECT	470µF	20%	50V
	C612	1-126-961-11	ELECT	2.2µF	20%	50V
	C613	1-161-964-91	CERAMIC	0.0047µF		250V
	C614	1-161-964-91	CERAMIC	0.0047µF		250V
	C615	1-161-964-91	CERAMIC	0.0047µF		250V
	C616	1-126-943-11	ELECT	2200µF	20%	25V
	C617	1-128-564-11	ELECT	220µF	20%	100V
	C618	1-128-564-11	ELECT	220µF	20%	100V
	C619	1-161-964-91	CERAMIC	0.0047µF		250V
	C620	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
	C621	1-165-922-11	ELECT	470µF	20%	250V
	C624	1-107-636-11	ELECT	10µF	20%	160V
	C625	1-126-964-11	ELECT	10µF	20%	50V
	C629	1-165-922-11	ELECT	470µF	20%	250V
⚠	C630	1-113-910-11	CERAMIC	470pF	10%	250V
⚠	C631	1-113-910-11	CERAMIC	470pF	10%	250V
	C632	1-126-967-11	ELECT	47µF	20%	50V
	C633	1-136-479-11	FILM	0.001µF	5%	100V
	C634	1-126-947-11	ELECT	47µF	20%	35V
	C635	1-126-963-11	ELECT	4.7µF	20%	50V
	C636	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	C637	1-127-715-91	CERAMIC CHIP	0.22µF	10%	16V
	C638	1-104-665-11	ELECT	100µF	20%	25V
	C640	1-164-644-11	CERAMIC	330pF	10%	500V
	C642	1-126-969-11	ELECT	220µF	20%	50V
	C643	1-130-777-00	MYLAR	0.1µF	5%	100V
	C645	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
	C647	1-126-947-11	ELECT	47µF	20%	35V
	C648	1-104-330-91	CERAMIC	470pF	10%	1KV
	C649	1-104-330-91	CERAMIC	470pF	10%	1KV
	C650	1-126-942-61	ELECT	1000µF	20%	25V
	C651	1-126-942-61	ELECT	1000µF	20%	25V
	C652	1-164-227-11	CERAMIC CHIP	0.022µF	10%	25V
	C660	1-126-947-11	ELECT	47µF	20%	35V
	C661	1-104-665-11	ELECT	100µF	20%	25V
	C663	1-126-963-11	ELECT	4.7µF	20%	50V
	C665	1-104-665-11	ELECT	100µF	20%	25V
	C672	1-137-756-22	FILM	22000pF	3%	800V
⚠	C680	1-127-793-51	CERAMIC	2200pF	20%	250V
⚠	C681	1-127-793-51	CERAMIC	2200pF	20%	250V
	C690	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V

CONNECTOR

*	CN002	1-564-509-11	PLUG, CONNECTOR	6P
*	CN003	1-560-124-00	PLUG, CONNECTOR (2.5MM)	4P
*	CN401	1-564-507-11	PLUG, CONNECTOR	4P
	CN402	1-564-505-11	PLUG, CONNECTOR	2P
	CN403	1-564-506-11	PLUG, CONNECTOR	3P
*	CN404	1-774-105-11	CONNECTOR, BOARD TO BOARD	15P
*	CN501	1-508-786-00	PIN, CONNECTOR (5MM PITCH)	2P
*	CN515	1-580-798-11	CONNECTOR PIN (DY)	6P
*	CN585	1-564-509-11	PLUG, CONNECTOR	6P
*	CN600	1-580-843-11	PIN, CONNECTOR (POWER)	

DIODE

D002	8-719-109-89	DIODE	RD5.6ESB2
D003	8-719-110-17	DIODE	RD10ESB2
D004	8-719-110-17	DIODE	RD10ESB2
D005	8-719-110-17	DIODE	RD10ESB2
D006	8-719-921-44	DIODE	MTZJ-5.1C

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

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REF. NO.	PART NO.	DESCRIPTION	VALUES
D044	8-719-110-17	DIODE	RD10ESB2
D045	8-719-110-17	DIODE	RD10ESB2
D050	8-719-991-33	DIODE	1SS133T-77
D051	8-719-991-33	DIODE	1SS133T-77
D052	8-719-109-89	DIODE	RD5.6ESB2
D200	8-719-929-15	DIODE	HZS9.1NB2
D201	8-719-929-15	DIODE	HZS9.1NB2
D202	8-719-929-15	DIODE	HZS9.1NB2
D203	8-719-929-15	DIODE	HZS9.1NB2
D204	8-719-929-15	DIODE	HZS9.1NB2
D205	8-719-929-15	DIODE	HZS9.1NB2
D206	8-719-929-15	DIODE	HZS9.1NB2
D208	8-719-929-15	DIODE	HZS9.1NB2
D230	8-719-108-12	DIODE	RD9.1EW
D231	8-719-108-12	DIODE	RD9.1EW
D232	8-719-108-12	DIODE	RD9.1EW
D234	8-719-108-12	DIODE	RD9.1EW
D235	8-719-108-12	DIODE	RD9.1EW
D236	8-719-108-12	DIODE	RD9.1EW
D237	8-719-108-12	DIODE	RD9.1EW
D351	8-719-109-66	DIODE	RD3.3ESB2
D390	8-719-404-50	DIODE	MA111-TX
D410	8-719-404-50	DIODE	MA111-TX
D412	1-216-864-11	SHORT CHIP	
D413	8-719-404-50	DIODE	MA111-TX
D414	8-719-921-63	DIODE	MTZJ-7.5B
D435	8-719-110-17	DIODE	RD10ESB2
D438	8-719-404-50	DIODE	MA111-TX
D501	8-719-404-50	DIODE	MA111-TX
D505	8-719-081-00	DIODE	BY228/A52A/
D506	8-719-979-85	DIODE	EGP20G
D508	8-719-404-50	DIODE	MA111-TX
D509	8-719-109-66	DIODE	RD3.3ESB2
D514	8-719-908-03	DIODE	GP08D
D515	8-719-908-03	DIODE	GP08D
D525	8-719-991-33	DIODE	1SS133T-77
D526	8-719-074-25	DIODE	PG104R
D528	8-719-991-33	DIODE	1SS133T-77
D545	8-719-908-03	DIODE	GP08D
D558	8-719-404-50	DIODE	MA111-TX
D559	8-719-404-50	DIODE	MA111-TX
⚠ D562	8-719-991-33	DIODE	1SS133T-77
⚠ D566	8-719-979-84	DIODE	EGP20DPKG23
⚠ D567	8-719-991-33	DIODE	1SS133T-77
D568	8-719-110-08	DIODE	RD8.2ESB2
⚠ D569	8-719-921-44	DIODE	MTZJ-5.1C
D587	8-719-074-25	DIODE	PG104R
⚠ D589	8-719-991-33	DIODE	1SS133T-77
D596	8-719-908-03	DIODE	GP08D
D598	8-719-908-03	DIODE	GP08D
D605	6-500-397-11	DIODE	GBJ4J10B9
D608	8-719-077-76	DIODE	D2SB60A-F04
D611	8-719-302-43	DIODE	EL1Z
D612	8-719-068-00 (LATIN NORTH ONLY)	DIODE	ERC04-06SE
D613	8-719-068-00 (LATIN NORTH ONLY)	DIODE	ERC04-06SE
D614	8-719-057-52	DIODE	EZ0150AV1
D615	6-500-177-01	DIODE	MA7D50
D618	8-719-979-64	DIODE	UF4005PKG23
D620	8-719-911-19	DIODE	1SS119-25
D621	8-719-510-37	DIODE	D5LC20U
D624	8-719-302-43	DIODE	EL1Z
D628	8-719-404-50	DIODE	MA111-TX
D629	8-719-110-31	DIODE	RD12ESB2
D630	8-719-982-22	DIODE	MTZJ-30D
D631	6-500-175-01	DIODE	1E3-TB
D650	8-719-109-89	DIODE	RD5.6ESB2

FUSE

⚠	F601	1-532-506-51 (LATIN SOUTH ONLY)	FUSE	6.3A	250V
⚠	F601	1-576-193-11 (LATIN NORTH ONLY)	FUSE	6.3A	125V

FERRITE BEAD

FB461	1-410-397-21	FERRITE	1.1µH
FB462	1-410-397-21	FERRITE	1.1µH
FB463	1-410-397-21	FERRITE	1.1µH
FB464	1-410-397-21	FERRITE	1.1µH
FB465	1-410-397-21	FERRITE	1.1µH
FB466	1-410-397-21	FERRITE	1.1µH
FB467	1-410-397-21	FERRITE	1.1µH
FB468	1-410-397-21	FERRITE	1.1µH
FB505	1-410-397-21	FERRITE	1.1µH
FB506	1-410-397-21	FERRITE	1.1µH

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REF. NO.	PART NO.	DESCRIPTION	VALUES
FB522	1-410-397-21	FERRITE	1.1µH
FB601	1-412-911-11	FERRITE	0µH
FB602	1-412-911-11	FERRITE	0µH
FB603	1-412-911-11	FERRITE	0µH
FB604	1-412-911-11	FERRITE	0µH
FB605	1-576-337-21	IC LINK	2.7A 50V
FB616	1-469-578-11	FERRITE	1.1µH
FB617	1-469-578-11	FERRITE	1.1µH
FB669	1-410-397-21	FERRITE	1.1µH
FB670	1-410-397-21	FERRITE	1.1µH
FB671	1-410-397-21	FERRITE	1.1µH
FB672	1-410-397-21	FERRITE	1.1µH
	FILTER		
FL001	1-239-803-11	ENCAPSULATED COMPONENT	
	IC		
⚠ IC001	6-800-842-01	IC	M65582µF-100FP
IC002	8-759-699-33	IC	M24C16-MN6T(A)
IC003	8-759-352-91	IC	PST9143NL
IC400	6-703-190-01	IC	NJW1134AGK1-TE2
IC545	8-759-835-98	IC	AN5522
⚠ IC561	8-759-700-07	IC	NJM2903M
IC565	8-759-700-44	IC	NJM2902M
IC600	8-759-670-30	IC	MCZ3001D
IC603	8-759-833-71	IC	NJM2395F09
⚠ IC604	8-749-012-13	IC	DM-58
IC608	6-701-752-01	IC	NJM2930F05B
IC633	6-703-080-01	IC	LF33CV
	JACK		
J200	1-794-119-11	TERMINAL BLOCK, S	4P
J201	1-794-048-11	JACK, PIN	3P
J202	1-794-116-11	JACK BLOCK, PIN	2P
* J205	1-817-529-11	JACK BLOCK, PIN	4P
J206	1-794-117-11	JACK BLOCK, PIN	3P
J401	1-750-264-11	JACK	

REF. NO.	PART NO.	DESCRIPTION	VALUES
	CHIP CONDUCTOR		
JR1	1-216-864-11	SHORT CHIP	
JR6	1-216-864-11	SHORT CHIP	
JR7	1-216-864-11	SHORT CHIP	
JR12	1-216-864-11	SHORT CHIP	
JR20	1-216-864-11	SHORT CHIP	
JR44	1-216-864-11	SHORT CHIP	
JR003	1-216-864-11	SHORT CHIP	
JR004	1-216-864-11	SHORT CHIP	
JR128	1-216-864-11	SHORT CHIP	
JR200	1-216-864-11	SHORT CHIP	
JR301	1-216-864-11	SHORT CHIP	
JR302	1-216-864-11	SHORT CHIP	
JR303	1-216-864-11	SHORT CHIP	
JR304	1-216-864-11	SHORT CHIP	
JR305	1-216-864-11	SHORT CHIP	
JR306	1-216-864-11	SHORT CHIP	
JR307	1-216-864-11	SHORT CHIP	
JR308	1-216-864-11	SHORT CHIP	
JR309	1-216-864-11	SHORT CHIP	
JR310	1-216-864-11	SHORT CHIP	
JR311	1-216-864-11	SHORT CHIP	
JR312	1-216-864-11	SHORT CHIP	
JR313	1-216-864-11	SHORT CHIP	
JR314	1-216-864-11	SHORT CHIP	
JR315	1-216-864-11	SHORT CHIP	
JR316	1-216-864-11	SHORT CHIP	
JR317	1-216-864-11	SHORT CHIP	
JR318	1-216-864-11	SHORT CHIP	
JR401	1-216-864-11	SHORT CHIP	
JR485	1-216-864-11	SHORT CHIP	
JR500	1-216-864-11	SHORT CHIP	
JR501	1-216-864-11	SHORT CHIP	
JR502	1-216-864-11	SHORT CHIP	
JR860	1-216-864-11	SHORT CHIP	
	JUMPER WIRE		
JW68	1-249-417-11	CARBON	1K 5% 1/4W
JW491	1-249-429-11	CARBON	10K 5% 1/4W

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	REF. NO.	PART NO.	DESCRIPTION	VALUES
		COIL		
	L002	1-239-803-11	ENCAPSULATED	COMPONENT
	L003	1-239-803-11	ENCAPSULATED	COMPONENT
	L004	1-239-803-11	ENCAPSULATED	COMPONENT
	L005	1-239-803-11	ENCAPSULATED	COMPONENT
	L006	1-414-273-11	INDUCTOR	100µH
	L007	1-414-273-11	INDUCTOR	100µH
	L008	1-414-857-11	INDUCTOR	100µH
	L009	1-414-857-11	INDUCTOR	100µH
	L010	1-414-267-21	INDUCTOR	10µH
	L101	1-414-229-11	FERRITE	0µH
	L360	1-414-267-21	INDUCTOR	10µH
	L361	1-414-267-21	INDUCTOR	10µH
⚠	L510	1-406-981-21	INDUCTOR	470µH
	L513	1-406-677-11	INDUCTOR	10MH
	L515	1-412-552-81	INDUCTOR	2.2MH
	L525	1-409-955-11	INDUCTOR	8MH
⚠	L588	1-412-528-81	INDUCTOR	18µH
	L606	1-412-525-31	INDUCTOR	10µH
	L607	1-412-525-31	INDUCTOR	10µH
	L608	1-412-533-21	INDUCTOR	47µH
	L609	1-412-525-31	INDUCTOR	10µH
		PHOTO COUPLER		
	PH602	8-749-010-64	PHOTO COUPLER	PC123F2
		TRANSISTOR		
	Q002	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q004	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q005	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q006	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q008	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q009	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q300	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q301	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q303	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q304	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q305	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q306	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q390	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q391	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q400	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q401	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q411	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q412	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q435	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q501	8-729-423-33	TRANSISTOR	2SC3311A-QRSTA
	Q502	8-729-140-50	TRANSISTOR	2SC3209LK
⚠	Q506	6-550-042-01	TRANSISTOR	2SD2627LS-YB11
	Q521	8-729-423-33	TRANSISTOR	2SC3311A-QRSTA
	Q522	8-729-053-87	TRANSISTOR	KTC4370A
	Q572	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q573	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q578	8-729-422-27	TRANSISTOR	2SD601A-Q
⚠	Q590	6-550-362-01	TRANSISTOR	KTA1279
	Q600	8-729-053-36	TRANSISTOR	2SK2640-01MR-F122
	Q601	8-729-053-36	TRANSISTOR	2SK2640-01MR-F122
	Q604	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q608	8-729-922-37	TRANSISTOR	2SD2144S-UVW
	Q650	6-550-409-01	TRANSISTOR	KSC2383-O
		RESISTOR		
	R002	1-216-864-11	SHORT CHIP	
	R003	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R004	1-216-817-11	METAL CHIP	470 5% 1/10W
	R006	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
	R015	1-216-833-11	METAL CHIP	10K 5% 1/10W
	R027	1-218-732-11	METAL CHIP	47K 0.50% 1/10W
	R028	1-249-409-11	CARBON	220 5% 1/4W
	R029	1-249-409-11	CARBON	220 5% 1/4W
	R030	1-249-409-11	CARBON	220 5% 1/4W
	R031	1-216-813-11	METAL CHIP	220 5% 1/10W
	R032	1-216-813-11	METAL CHIP	220 5% 1/10W
	R033	1-249-409-11	CARBON	220 5% 1/4W
	R035	1-216-809-11	METAL CHIP	100 5% 1/10W
	R036	1-216-825-11	METAL CHIP	2.2K 5% 1/10W
	R037	1-216-833-11	METAL CHIP	10K 5% 1/10W
	R038	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R039	1-216-815-11	METAL CHIP	330 5% 1/10W
	R040	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
	R041	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
	R042	1-216-813-11	METAL CHIP	220 5% 1/10W
	R043	1-216-813-11	METAL CHIP	220 5% 1/10W
	R044	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
	R045	1-216-829-11	METAL CHIP	4.7K 5% 1/10W

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R047	1-249-409-11	CARBON	220	5%	1/4W
R048	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R049	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R050	1-249-425-11	CARBON	4.7K	5%	1/4W
R051	1-249-417-11	CARBON	1K	5%	1/4W
R052	1-216-813-11	METAL CHIP	220	5%	1/10W
R053	1-249-433-11	CARBON	22K	5%	1/4W
R054	1-249-433-11	CARBON	22K	5%	1/4W
R055	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R056	1-216-833-11	METAL CHIP	10K	5%	1/10W
R057	1-249-417-11	CARBON	1K	5%	1/4W
R058	1-249-429-11	CARBON	10K	5%	1/4W
R059	1-249-417-11	CARBON	1K	5%	1/4W
R060	1-249-409-11	CARBON	220	5%	1/4W
R061	1-249-429-11	CARBON	10K	5%	1/4W
R062	1-249-413-11	CARBON	470	5%	1/4W
R063	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R065	1-249-415-11	CARBON	680	5%	1/4W
R067	1-249-416-11	CARBON	820	5%	1/4W
R069	1-249-421-11	CARBON	2.2K	5%	1/4W
R070	1-249-409-11	CARBON	220	5%	1/4W
R071	1-249-427-11	CARBON	6.8K	5%	1/4W
R072	1-249-425-11	CARBON	4.7K	5%	1/4W
R073	1-249-419-11	CARBON	1.5K	5%	1/4W
R074	1-249-421-11	CARBON	2.2K	5%	1/4W
R075	1-249-427-11	CARBON	6.8K	5%	1/4W
R076	1-247-807-31	CARBON	100	5%	1/4W
R080	1-216-833-11	METAL CHIP	10K	5%	1/10W
R081	1-216-841-11	METAL CHIP	47K	5%	1/10W
R082	1-216-857-11	METAL CHIP	1M	5%	1/10W
R083	1-216-847-11	METAL CHIP	150K	5%	1/10W
R084	1-216-819-11	METAL CHIP	680	5%	1/10W
R085	1-216-864-11	SHORT CHIP			
R086	1-216-821-11	METAL CHIP	1K	5%	1/10W
R087	1-247-807-31	CARBON	100	5%	1/4W
R090	1-216-837-11	METAL CHIP	22K	5%	1/10W
R091	1-216-841-11	METAL CHIP	47K	5%	1/10W
R092	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R093	1-216-841-11	METAL CHIP	47K	5%	1/10W
R094	1-216-864-11	SHORT CHIP			
R095	1-216-864-11	SHORT CHIP			
R096	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R098	1-216-839-11	METAL CHIP	33K	5%	1/10W
R101	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R102	1-216-837-11	METAL CHIP	22K	5%	1/10W
R103	1-216-833-11	METAL CHIP	10K	5%	1/10W
R105	1-216-864-11	SHORT CHIP			
R107	1-414-229-11	FERRITE	0µH		
R108	1-414-229-11	FERRITE	0µH		
R109	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R110	1-249-409-11	CARBON	220	5%	1/4W
R111	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R112	1-249-425-11	CARBON	4.7K	5%	1/4W
R115	1-216-817-11	METAL CHIP	470	5%	1/10W
R116	1-216-853-11	METAL CHIP	470K	5%	1/10W
R200	1-216-813-11	METAL CHIP	220	5%	1/10W
R201	1-216-809-11	METAL CHIP	100	5%	1/10W
R202	1-216-845-11	METAL CHIP	100K	5%	1/10W
R203	1-216-845-11	METAL CHIP	100K	5%	1/10W
R206	1-216-845-11	METAL CHIP	100K	5%	1/10W
R207	1-216-845-11	METAL CHIP	100K	5%	1/10W
R208	1-249-409-11	CARBON	220	5%	1/4W
R209	1-249-409-11	CARBON	220	5%	1/4W
R210	1-216-845-11	METAL CHIP	100K	5%	1/10W
R211	1-249-409-11	CARBON	220	5%	1/4W
R212	1-249-409-11	CARBON	220	5%	1/4W
R213	1-216-845-11	METAL CHIP	100K	5%	1/10W
R215	1-216-845-11	METAL CHIP	100K	5%	1/10W
R216	1-216-845-11	METAL CHIP	100K	5%	1/10W
R217	1-216-813-11	METAL CHIP	220	5%	1/10W
R218	1-216-813-11	METAL CHIP	220	5%	1/10W
R220	1-216-813-11	METAL CHIP	220	5%	1/10W
R221	1-249-409-11	CARBON	220	5%	1/4W
R222	1-249-409-11	CARBON	220	5%	1/4W
R226	1-218-285-11	METAL CHIP	75	5%	1/10W
R227	1-218-285-11	METAL CHIP	75	5%	1/10W
R250	1-216-864-11	SHORT CHIP			
R251	1-216-864-11	SHORT CHIP			
R301	1-218-285-11	METAL CHIP	75	5%	1/10W
R303	1-218-285-11	METAL CHIP	75	5%	1/10W
R305	1-218-285-11	METAL CHIP	75	5%	1/10W
R306	1-218-285-11	METAL CHIP	75	5%	1/10W
R307	1-218-285-11	METAL CHIP	75	5%	1/10W
R308	1-216-821-11	METAL CHIP	1K	5%	1/10W
R309	1-216-833-11	METAL CHIP	10K	5%	1/10W
R310	1-216-821-11	METAL CHIP	1K	5%	1/10W
R311	1-216-813-11	METAL CHIP	220	5%	1/10W
R312	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

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REF. NO.	PART NO.	DESCRIPTION	VALUES		
R313	1-216-864-11	SHORT CHIP			
R314	1-216-833-11	METAL CHIP	10K	5%	1/10W
R315	1-216-813-11	METAL CHIP	220	5%	1/10W
R316	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R317	1-216-813-11	METAL CHIP	220	5%	1/10W
R318	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R319	1-216-813-11	METAL CHIP	220	5%	1/10W
R320	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R321	1-247-807-31	CARBON	100	5%	1/4W
R322	1-216-817-11	METAL CHIP	470	5%	1/10W
R323	1-249-414-11	CARBON	560	5%	1/4W
R324	1-216-826-11	METAL CHIP	2.7K	5%	1/10W
R337	1-216-801-11	METAL CHIP	22	5%	1/10W
R351	1-216-833-11	METAL CHIP	10K	5%	1/10W
R352	1-216-853-11	METAL CHIP	470K	5%	1/10W
R360	1-216-809-11	METAL CHIP	100	5%	1/10W
R361	1-216-809-11	METAL CHIP	100	5%	1/10W
R370	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R371	1-216-857-11	METAL CHIP	1M	5%	1/10W
R372	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R390	1-216-864-11	SHORT CHIP			
R391	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R392	1-216-818-11	METAL CHIP	560	5%	1/10W
R393	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R394	1-216-833-11	METAL CHIP	10K	5%	1/10W
R400	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R401	1-216-809-11	METAL CHIP	100	5%	1/10W
R402	1-216-864-11	SHORT CHIP			
R403	1-216-809-11	METAL CHIP	100	5%	1/10W
R406	1-216-813-11	METAL CHIP	220	5%	1/10W
R407	1-216-813-11	METAL CHIP	220	5%	1/10W
R415	1-216-864-11	SHORT CHIP			
R416	1-216-864-11	SHORT CHIP			
R435	1-216-833-11	METAL CHIP	10K	5%	1/10W
R436	1-216-864-11	SHORT CHIP			
R437	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R438	1-249-417-11	CARBON	1K	5%	1/4W
R440	1-249-409-11	CARBON	220	5%	1/4W
R441	1-249-409-11	CARBON	220	5%	1/4W
R461	1-216-845-11	METAL CHIP	100K	5%	1/10W
R463	1-249-437-11	CARBON	47K	5%	1/4W
R477	1-216-819-11	METAL CHIP	680	5%	1/10W
R478	1-216-833-11	METAL CHIP	10K	5%	1/10W
R479	1-216-821-11	METAL CHIP	1K	5%	1/10W

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R482	1-216-864-11	SHORT CHIP			
R494	1-216-833-11	METAL CHIP	10K	5%	1/10W
R498	1-216-864-11	SHORT CHIP			
R499	1-216-833-11	METAL CHIP	10K	5%	1/10W
R502	1-249-425-11	CARBON	4.7K	5%	1/4W
R503	1-215-921-11	METAL OXIDE	4.7K	5%	3W
R504	1-102-212-00	CERAMIC	820pF	10%	500V
R507	1-216-833-11	METAL CHIP	10K	5%	1/10W
R510	1-260-320-11	CARBON	220	5%	1/2W
R512	1-215-910-00	METAL OXIDE	68	5%	3W
R513	1-215-913-11	METAL OXIDE	220	5%	3W
R514	1-215-910-00	METAL OXIDE	68	5%	3W
R515	1-215-886-11	METAL OXIDE	100	5%	2W
R520	1-216-833-11	METAL CHIP	10K	5%	1/10W
R521	1-216-819-11	METAL CHIP	680	5%	1/10W
R522	1-249-411-11	CARBON	330	5%	1/4W
R524	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
R525	1-215-861-00	METAL OXIDE	47	5%	1W
R526	1-216-837-11	METAL CHIP	22K	5%	1/10W
R527	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
⚠ R528	1-218-867-11	METAL CHIP	6.8K	0.50%	1/10W
R529	1-218-724-11	METAL CHIP	22K	0.50%	1/10W
R530	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R533	1-216-826-11	METAL CHIP	2.7K	5%	1/10W
R534	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
R535	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R536	1-216-833-11	METAL CHIP	10K	5%	1/10W
R537	1-216-855-11	METAL CHIP	680K	5%	1/10W
R539	1-216-864-11	SHORT CHIP			
R540	1-249-429-11	CARBON	10K	5%	1/4W
R541	1-215-449-00	METAL	15K	1%	1/4W
R542	1-215-445-00	METAL	10K	1%	1/4W
R543	1-216-351-00	METAL OXIDE	1.5	5%	1W
R545	1-215-890-11	METAL OXIDE	470	5%	2W
R546	1-249-385-11	CARBON	2.2	5%	1/4W
R547	1-215-445-00	METAL	10K	1%	1/4W
R548	1-218-720-11	METAL CHIP	15K	0.50%	1/10W
R549	1-216-841-11	METAL CHIP	47K	5%	1/10W
	(LATIN SOUTH ONLY)				
R550	1-216-817-11	METAL CHIP	470	5%	1/10W
R553	1-216-821-11	METAL CHIP	1K	5%	1/10W
R555	1-216-833-11	METAL CHIP	10K	5%	1/10W
R557	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R560	1-216-821-11	METAL CHIP	1K	5%	1/10W

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

A component identified by this ⋈ symbol indicates that it has been carefully factory-selected to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

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	REF. NO.	PART NO.	DESCRIPTION	VALUES		
⚠	R561	1-216-833-11	METAL CHIP	10K	5%	1/10W
⚠	R562	1-249-429-11	CARBON	10K	5%	1/4W
⚠	R563	1-216-833-11	METAL CHIP	10K	5%	1/10W
⚠	⋈R565	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
⚠	R566	1-215-469-00	METAL	100K	1%	1/4W
⚠	R567	1-215-879-11	METAL OXIDE	47K	5%	1W
⚠	R568	1-215-416-00	METAL	620	1%	1/4W
	R569	1-249-429-11	CARBON	10K	5%	1/4W
	R570	1-249-429-11	CARBON	10K	5%	1/4W
	R572	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R573	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
	R574	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R575	1-249-389-11	CARBON	4.7	5%	1/4W
	R578	1-249-429-11	CARBON	10K	5%	1/4W
	R581	1-249-441-11	CARBON	100K	5%	1/4W
	R583	1-249-377-11	CARBON	0.47	5%	1/4W
	R584	1-215-453-00	METAL	22K	1%	1/4W
	R585	1-215-453-00	METAL	22K	1%	1/4W
	R586	1-215-429-00	METAL	2.2K	1%	1/4W
	R587	1-249-401-11	CARBON	47	5%	1/4W
	R588	1-215-882-00	METAL OXIDE	22	5%	2W
⚠	R589	1-247-895-91	CARBON	470K	5%	1/4W
⚠	R590	1-249-429-11	CARBON	10K	5%	1/4W
⚠	R591	1-216-365-00	METAL OXIDE	0.47	5%	2W
⚠	R592	1-249-441-11	CARBON	100K	5%	1/4W
⚠	R593	1-249-429-11	CARBON	10K	5%	1/4W
⚠	R594	1-249-417-11	CARBON	1K	5%	1/4W
⚠	R595	1-247-895-91	CARBON	470K	5%	1/4W
	R596	1-249-377-11	CARBON	0.47	5%	1/4W
	R597	1-216-849-11	METAL CHIP	220K	5%	1/10W
	R598	1-249-377-11	CARBON	0.47	5%	1/4W
	R600	1-219-512-11	METAL	2.2M	5%	1/2W
	R601	1-240-262-11	CEMENT	0.68	5%	10W
		(LATIN NORTH ONLY)				
	R601	1-244-206-11	WIREWOUND	2.2	5%	10W
		(LATIN SOUTH ONLY)				
	R602	1-202-961-11	CEMENT	1.8	5%	10W
		(LATIN NORTH ONLY)				
	R602	1-244-206-11	WIREWOUND	2.2	5%	10W
		(LATIN SOUTH ONLY)				
⚠	R603	1-219-513-11	METAL	4.7M	5%	1/2W
		(LATIN NORTH ONLY)				
	R604	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R605	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R606	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R607	1-216-857-11	METAL CHIP	1M	5%	1/10W
	R608	1-215-924-00	METAL OXIDE	15K	5%	3W
	R609	1-240-251-11	CEMENTED	6.8	5%	10W
	R612	1-260-131-11	CARBON	470K	5%	1/2W
	R614	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
	R615	1-202-933-61	FUSIBLE	0.1	10%	1/2W
	R616	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R617	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R619	1-249-377-11	CARBON	0.47	5%	1/4W
	R620	1-216-353-00	METAL OXIDE	2.2	5%	1W
	R625	1-249-413-11	CARBON	470	5%	1/4W
	R626	1-218-715-11	METAL CHIP	9.1K	0.50%	1/10W
	R627	1-215-481-00	METAL	330K	1%	1/4W
	R628	1-260-131-11	CARBON	470K	5%	1/2W
	R629	1-215-481-00	METAL	330K	1%	1/4W
	R630	1-215-481-00	METAL	330K	1%	1/4W
	R631	1-218-718-11	METAL CHIP	12K	0.50%	1/10W
	R632	1-216-809-11	METAL CHIP	100	5%	1/10W
	R634	1-215-907-11	METAL OXIDE	22	5%	3W
	R640	1-249-417-11	CARBON	1K	5%	1/4W
	R647	1-216-811-11	METAL CHIP	150	5%	1/10W
	R650	1-249-415-11	CARBON	680	5%	1/4W
	R651	1-249-441-11	CARBON	100K	5%	1/4W
	R652	1-249-441-11	CARBON	100K	5%	1/4W
	R658	1-249-393-11	CARBON	10	5%	1/4W
	R659	1-249-393-11	CARBON	10	5%	1/4W
	R660	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R667	1-216-833-11	METAL CHIP	10K	5%	1/10W
⚠	R668	1-249-418-11	CARBON	1.2K	5%	1/4W
	R670	1-216-833-11	METAL CHIP	10K	5%	1/10W
	R671	1-243-979-71	METAL OXIDE	0.1	5%	2W
	R680	1-216-864-11	SHORT CHIP			
	R687	1-202-961-11	CEMENT	1.8	5%	10W
		(LATIN NORTH ONLY)				
	R687	1-244-206-11	WIREWOUND	2.2	5%	10W
		(LATIN SOUTH ONLY)				
⚠	R699	1-218-265-11	METAL	8.2M	5%	1W
		(LATIN SOUTH ONLY)				
	R850	1-215-451-00	METAL	18K	1%	1/4W
	R851	1-216-821-11	METAL CHIP	1K	5%	1/10W
	R852	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
	R862	1-216-813-11	METAL CHIP	220	5%	1/10W

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

A M3

REF. NO.	PART NO.	DESCRIPTION	VALUES
	RELAY		
RY501	1-755-198-11	RELAY, AC POWER	
⚠ RY600	1-755-395-11	RELAY (AC POWER)	
	SWITCH		
S002	1-692-431-21	SWITCH, TACTILE	
S003	1-692-431-21	SWITCH, TACTILE	
S004	1-692-431-21	SWITCH, TACTILE	
S005	1-692-431-21	SWITCH, TACTILE	
S006	1-692-431-21	SWITCH, TACTILE	
S007	1-762-816-11	SWITCH, TACTILE	
S008	1-762-816-11	SWITCH, TACTILE	
SW515	1-572-707-11	SWITCH, LEVER	
	TRANSFORMER		
T505	1-433-836-11	TRANSFORMER, HORIZONTAL DRIVE	
⚠ T511	1-435-079-21	TRANSFORMER, HORIZONTAL LINEAR	
⚠ T585	1-453-316-21	FBT ASSY NX-1748//X4A4	
⚠ T601	1-435-617-11	TRANSFORMER, LINE FILTER	
⚠ T602	1-435-675-11	TRANSFORMER, STANDBY (LATIN NORTH ONLY)	
⚠ T602	1-435-676-11	TRANSFORMER, STANDBY (LATIN SOUTH ONLY)	
⚠ T603	1-437-611-11	CONVERTER TRANSFORMER	
	THERMISTOR		
THP501	1-803-539-11	THERMISTOR (LATIN NORTH ONLY)	
THP501	1-803-540-11	THERMISTOR (LATIN SOUTH ONLY)	
	TUNER		
⚠ TU101	8-598-593-50	TUNER, FSS BTF-WA421	
	VARISTOR		
VDR600	1-803-585-11	VARISTOR (LATIN NORTH ONLY)	(ENE271D-10A)
VDR600	1-803-967-11	VARISTOR (LATIN SOUTH ONLY)	(ENE621D-14A)

REF. NO.	PART NO.	DESCRIPTION	VALUES
	CRYSTAL		
X001	1-795-006-21	OSCILLATOR, CRYSTAL	
X301	1-781-377-21	VIBRATOR, CRYSTAL	

M3

*	**A-1400-738-A**	**M3 (VAR) BOARD, MOUNTED**	
	CAPACITOR		
C10	1-126-947-11	ELECT	47µF 20% 35V
C11	1-162-970-11	CERAMIC CHIP	0.01µF 10% 25V
C12	1-163-275-11	CERAMIC CHIP	0.001µF 5% 50V
C13	1-162-970-11	CERAMIC CHIP	0.01µF 10% 25V
C14	1-163-275-11	CERAMIC CHIP	0.001µF 5% 50V
C50	1-126-959-11	ELECT	0.47µF 20% 50V
C51	1-126-935-11	ELECT	470µF 20% 16V
C70	1-126-947-11	ELECT	47µF 20% 35V
C71	1-162-970-11	CERAMIC CHIP	0.01µF 10% 25V
C80	1-126-947-11	ELECT	47µF 20% 35V
	CONNECTOR		
* CN10	1-816-567-11	HEADER ASSY	FORPRINTEDBOARD 6P
	DIODE		
D50	8-719-404-50	DIODE	MA111-TX
	IC		
IC1	8-759-700-07	IC	NJM2903M
IC2	8-759-700-07	IC	NJM2903M
IC3	8-759-701-01	IC	NJM2904M
	COIL		
L50	1-408-615-31	INDUCTOR	100µH
	TRANSISTOR		
Q50	8-729-422-27	TRANSISTOR	2SD601A-Q
Q51	8-729-422-27	TRANSISTOR	2SD601A-Q
Q52	8-729-422-27	TRANSISTOR	2SD601A-Q

M3 HR CV

REF. NO.	PART NO.	DESCRIPTION	VALUES		
	RESISTOR				
R10	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W
R11	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W
R12	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R13	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W
R50	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R51	1-216-833-11	METAL CHIP	10K	5%	1/10W
R52	1-216-833-11	METAL CHIP	10K	5%	1/10W
R53	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R54	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R55	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R56	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R57	1-216-864-11	SHORT CHIP			
R58	1-216-835-11	METAL CHIP	15K	5%	1/10W
R59	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R70	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R71	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R72	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R74	1-218-740-11	METAL CHIP	100K	0.50%	1/10W
R75	1-218-740-11	METAL CHIP	100K	0.50%	1/10W
R76	1-218-732-11	METAL CHIP	47K	0.50%	1/10W
R77	1-218-740-11	METAL CHIP	100K	0.50%	1/10W
R78	1-208-814-91	METAL CHIP	22K	0.50%	1/10W
R79	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W

HR

*	**A-1400-251-A**	**HR (COM) BOARD, MOUNTED**	
	CAPACITOR		
C3001	1-104-665-11	ELECT	100µF 20% 25V
	CONNECTOR		
* CN3001	1-564-521-11	PLUG, CONNECTOR	6P
	DIODE		
D3002	8-719-057-09	DIODE	LNJ801LPDJA
	IC		
IC3001	8-742-211-20	HYB IC	SBX3071-71

REF. NO.	PART NO.	DESCRIPTION	VALUES		
	RESISTOR				
R3001	1-249-417-11	CARBON	1K	5%	1/4W
R3014	1-247-807-31	CARBON	100	5%	1/4W
	SWITCH				
S3006	1-786-338-11	SWITCH, TACTILE			

CV

*	**A-1400-223-A**	**CV (VAR) BOARD, MOUNTED (LATIN NORTH ONLY)**	
*	**A-1400-981-A**	**CV (VAR) BOARD, MOUNTED (LATIN SOUTH ONLY)**	
	4-382-854-11	SCREW (M3X10), P, SW (+)	
	CAPACITOR		
C780	1-162-926-11	CERAMIC CHIP	82pF 5% 50V
C781	1-162-926-11	CERAMIC CHIP	82pF 5% 50V
C782	1-162-926-11	CERAMIC CHIP	82pF 5% 50V
C901	1-107-667-11	ELECT	2.2µF 20% 400V
C902	1-130-491-00	MYLAR	0.047µF 5% 50V
C903	1-126-935-11	ELECT	470µF 20% 16V
C904	1-130-471-00	MYLAR	0.001µF 5% 50V
C905	1-106-383-00	MYLAR	0.047µF 10% 200V
C906	1-130-471-00	MYLAR	0.001µF 5% 50V
C907	1-107-638-11	ELECT	33µF 20% 160V
C908	1-126-935-11	ELECT	470µF 20% 16V
C909	1-161-830-00	CERAMIC	0.0047µF 500V
C910	1-104-999-11	MYLAR	0.1µF 5% 200V
C911	1-104-665-11	ELECT	100µF 20% 25V
C912	1-126-935-11	ELECT	470µF 20% 16V
C914	1-130-491-00	MYLAR	0.047µF 5% 50V
C915	1-162-970-11	CERAMIC CHIP	0.01µF 10% 25V
C1751	1-107-652-11	ELECT	10µF 20% 250V
C1752	1-162-114-00	CERAMIC	0.0047µF 2KV
C1753	1-137-528-11	MYLAR	0.1µF 10% 250V
C1754	1-102-074-00	CERAMIC	0.001µF 10% 50V
C1755	1-107-649-11	ELECT	2.2µF 20% 250V
C1774	1-126-947-11	ELECT	47µF 20% 35V
C1775	1-126-935-11	ELECT	470µF 20% 16V
C1777	1-126-963-11	ELECT	4.7µF 20% 50V
C1778	1-126-947-11	ELECT (LATIN SOUTH ONLY)	47µF 20% 35V

	REF. NO.	PART NO.	DESCRIPTION	VALUES
		CONNECTOR		
	CN903	1-564-506-11	PLUG, CONNECTOR	3P
	CN1707	1-564-506-11	PLUG, CONNECTOR	3P
	CN1751	1-564-509-11	PLUG, CONNECTOR	6P
*	CN1752	1-564-512-11	PLUG, CONNECTOR	9P
	CN1753	1-785-879-11	CONNECTOR, ONE TOUCH	
	CN1755	1-695-915-11	TAB (CONTACT)	
		DIODE		
	D762	8-719-404-50	DIODE	MA111-TX
	D763	8-719-404-50	DIODE	MA111-TX
	D772	8-719-404-50	DIODE	MA111-TX
	D773	8-719-404-50	DIODE	MA111-TX
	D782	8-719-404-50	DIODE	MA111-TX
	D783	8-719-404-50	DIODE	MA111-TX
	D901	8-719-110-86	DIODE	RD39ESB
	D902	8-719-110-86	DIODE	RD39ESB
	D903	8-719-991-33	DIODE	1SS133T-77
	D1754	8-719-901-83	DIODE	1SS83
	D1755	8-719-901-83	DIODE	1SS83
	D1756	8-719-901-83	DIODE	1SS83
	D1758	8-719-074-25	DIODE	PG104R
		IC		
	IC1707	8-759-356-16	IC	NJM4556AD
	IC1751	8-759-562-43	IC	TDA6108JF/N1B
		JUMPER WIRE		
	JW705	1-249-399-11	CARBON	33 5% 1/4W
		COIL		
	L710	1-410-387-11	INDUCTOR	33µH
	L711	1-410-387-11	INDUCTOR	33µH
	L712	1-410-387-11	INDUCTOR	33µH
	L901	1-408-615-31	INDUCTOR	100µH
	L1751	1-408-613-31	INDUCTOR	68µH
		TRANSISTOR		
	Q761	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q762	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q763	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q771	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q772	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q773	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q781	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q782	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q783	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q901	8-729-053-87	TRANSISTOR	KTC4370A
	Q902	6-550-247-01	TRANSISTOR	KTA1659A
	Q903	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q904	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q905	8-729-424-02	TRANSISTOR	2SB709A-QRS-TX
	Q906	8-729-422-27	TRANSISTOR	2SD601A-Q
	Q1772	8-729-422-27	TRANSISTOR	2SD601A-Q
		(LATIN SOUTH ONLY)		
		RESISTOR		
	R760	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
	R762	1-218-692-11	METAL CHIP	1K 0.50% 1/10W
	R763	1-216-835-11	METAL CHIP	15K 5% 1/10W
	R764	1-218-678-11	METAL CHIP	270 0.50% 1/10W
	R765	1-218-700-11	METAL CHIP	2.2K 0.50% 1/10W
	R766	1-216-827-11	METAL CHIP	3.3K 5% 1/10W
	R767	1-216-830-11	METAL CHIP	5.6K 5% 1/10W
	R768	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R769	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R770	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
	R771	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R772	1-218-692-11	METAL CHIP	1K 0.50% 1/10W
	R773	1-216-835-11	METAL CHIP	15K 5% 1/10W
	R774	1-218-678-11	METAL CHIP	270 0.50% 1/10W
	R775	1-218-700-11	METAL CHIP	2.2K 0.50% 1/10W
	R776	1-216-827-11	METAL CHIP	3.3K 5% 1/10W
	R777	1-216-830-11	METAL CHIP	5.6K 5% 1/10W
	R778	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R779	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R780	1-216-829-11	METAL CHIP	4.7K 5% 1/10W
	R782	1-218-692-11	METAL CHIP	1K 0.50% 1/10W
	R783	1-216-835-11	METAL CHIP	15K 5% 1/10W
	R784	1-218-678-11	METAL CHIP	270 0.50% 1/10W
	R785	1-218-700-11	METAL CHIP	2.2K 0.50% 1/10W
	R786	1-216-827-11	METAL CHIP	3.3K 5% 1/10W
	R787	1-216-830-11	METAL CHIP	5.6K 5% 1/10W
	R788	1-216-821-11	METAL CHIP	1K 5% 1/10W
	R901	1-249-401-11	CARBON	47 5% 1/4W

CV K

REF. NO.	PART NO.	DESCRIPTION	VALUES		
R902	1-249-386-11	CARBON	2.7	5%	1/4W
R903	1-249-414-11	CARBON	560	5%	1/4W
R904	1-249-432-11	CARBON	18K	5%	1/4W
R905	1-249-417-11	CARBON	1K	5%	1/4W
R906	1-249-432-11	CARBON	18K	5%	1/4W
R907	1-249-386-11	CARBON	2.7	5%	1/4W
R908	1-249-414-11	CARBON	560	5%	1/4W
R909	1-260-312-11	CARBON	47	5%	1/2W
R910	1-216-476-11	METAL OXIDE	180	5%	3W
R911	1-216-799-11	METAL CHIP	15	5%	1/10W
R912	1-216-813-11	METAL CHIP	220	5%	1/10W
R913	1-216-799-11	METAL CHIP	15	5%	1/10W
R914	1-216-814-11	METAL CHIP	270	5%	1/10W
R915	1-216-821-11	METAL CHIP	1K	5%	1/10W
R916	1-216-821-11	METAL CHIP	1K	5%	1/10W
R917	1-216-821-11	METAL CHIP	1K	5%	1/10W
R918	1-216-809-11	METAL CHIP	100	5%	1/10W
R919	1-216-809-11	METAL CHIP	100	5%	1/10W
R920	1-216-820-11	METAL CHIP	820	5%	1/10W
R921	1-216-833-11	METAL CHIP	10K	5%	1/10W
R922	1-249-397-11	CARBON	22	5%	1/4W
R923	1-249-401-11	CARBON	47	5%	1/4W
R1756	1-260-328-11	CARBON	1K	5%	1/2W
R1757	1-260-328-11	CARBON	1K	5%	1/2W
R1758	1-260-328-11	CARBON	1K	5%	1/2W
R1760	1-260-123-11	CARBON	100K	5%	1/2W
R1762	1-216-375-00	METAL OXIDE	3.3	5%	2W
R1763	1-247-807-31	CARBON	100	5%	1/4W
R1764	1-247-807-31	CARBON	100	5%	1/4W
R1765	1-247-807-31	CARBON	100	5%	1/4W
R1766	1-247-807-31	CARBON	100	5%	1/4W
R1767	1-247-807-31	CARBON	100	5%	1/4W
R1768	1-247-807-31	CARBON	100	5%	1/4W
R1770	1-260-132-11	CARBON	560K	5%	1/2W
R1778	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1779	1-247-791-91	CARBON	22	5%	1/4W
	(LATIN NORTH ONLY)				
R1780	1-216-837-11	METAL CHIP	22K	5%	1/10W
R1781	1-216-838-11	METAL CHIP	27K	5%	1/10W
R1787	1-216-837-11	METAL CHIP	22K	5%	1/10W
R1788	1-249-421-11	CARBON	2.2K	5%	1/4W
	(LATIN SOUTH ONLY)				
R1789	1-249-425-11	CARBON	4.7K	5%	1/4W
	(LATIN SOUTH ONLY)				

REF. NO.	PART NO.	DESCRIPTION	VALUES		
	VARIABLE RESISTOR				
RV1701	1-238-019-11	RES, ADJ, METAL FILM	47K		
	(LATIN SOUTH ONLY)				
RV1750	1-241-656-11	RES, ADJ, METAL FILM	110M		

K

* **A-1404-858-A K BOARD, MOUNTED**

4-382-854-11 SCREW (M3X10), P, SW (+)

CAPACITOR

C4001	1-130-491-00	MYLAR	0.047µF	5%	50V
C4002	1-130-481-00	MYLAR	0.0068µF	5%	50V
C4003	1-126-947-11	ELECT	47µF	20%	35V
C4004	1-135-574-91	MYLAR	100pF	5%	50V
C4005	1-130-495-00	MYLAR	0.1µF	5%	50V
C4007	1-126-947-11	ELECT	47µF	20%	35V
C4010	1-130-499-00	MYLAR	0.22µF	5%	50V
C4011	1-130-499-00	MYLAR	0.22µF	5%	50V
C4012	1-126-943-11	ELECT	2200µF	20%	25V
C4013	1-130-499-00	MYLAR	0.22µF	5%	50V
C4014	1-126-947-11	ELECT	47µF	20%	35V
C4016	1-130-499-00	MYLAR	0.22µF	5%	50V
C4017	1-130-499-00	MYLAR	0.22µF	5%	50V
C4018	1-130-495-00	MYLAR	0.1µF	5%	50V
C4019	1-130-495-00	MYLAR	0.1µF	5%	50V
C4020	1-130-499-00	MYLAR	0.22µF	5%	50V
C4021	1-130-499-00	MYLAR	0.22µF	5%	50V
C4022	1-126-943-11	ELECT	2200µF	20%	25V
C4023	1-130-499-00	MYLAR	0.22µF	5%	50V
C4024	1-137-194-81	FILM	0.47µF	5%	50V
C4025	1-137-194-81	FILM	0.47µF	5%	50V
C4040	1-136-169-00	FILM	0.22µF	5%	50V
C4041	1-136-169-00	FILM	0.22µF	5%	50V

CONNECTOR

CN4001	1-564-506-11	PLUG, CONNECTOR)	3P

IC

IC4001	6-701-107-01	IC	AN7125Z
IC4002	6-701-107-01	IC	AN7125Z
IC4003	8-759-356-16	IC	NJM4556AD

K KB

REF. NO.	PART NO.	DESCRIPTION	VALUES		
	IC LINK				
PS4001	1-576-337-21	IC LINK	2.7A	50V	
PS4002	1-576-337-21	IC LINK	2.7A	50V	
	RESISTOR				
R4001	1-249-429-11	CARBON	10K	5%	1/4W
R4002	1-249-436-11	CARBON	39K	5%	1/4W
R4003	1-249-436-11	CARBON	39K	5%	1/4W
R4004	1-249-436-11	CARBON	39K	5%	1/4W
R4005	1-249-413-11	CARBON	470	5%	1/4W
R4006	1-249-413-11	CARBON	470	5%	1/4W
R4007	1-249-425-11	CARBON	4.7K	5%	1/4W
R4008	1-249-425-11	CARBON	4.7K	5%	1/4W
R4009	1-249-419-11	CARBON	1.5K	5%	1/4W
R4010	1-249-413-11	CARBON	470	5%	1/4W
R4011	1-249-425-11	CARBON	4.7K	5%	1/4W
R4017	1-249-385-11	CARBON	2.2	5%	1/4W
R4018	1-249-385-11	CARBON	2.2	5%	1/4W
R4019	1-249-425-11	CARBON	4.7K	5%	1/4W
R4020	1-249-385-11	CARBON	2.2	5%	1/4W
R4021	1-249-385-11	CARBON	2.2	5%	1/4W
R4022	1-249-421-11	CARBON	2.2K	5%	1/4W
R4023	1-249-421-11	CARBON	2.2K	5%	1/4W
R4024	1-249-441-11	CARBON	100K	5%	1/4W
R4025	1-249-441-11	CARBON	100K	5%	1/4W
R4026	1-249-429-11	CARBON	10K	5%	1/4W
R4027	1-249-429-11	CARBON	10K	5%	1/4W
R4028	1-249-385-11	CARBON	2.2	5%	1/4W
R4029	1-249-385-11	CARBON	2.2	5%	1/4W
R4030	1-249-425-11	CARBON	4.7K	5%	1/4W
R4031	1-249-433-11	CARBON	22K	5%	1/4W
R4032	1-249-433-11	CARBON	22K	5%	1/4W
R4040	1-249-385-11	CARBON	2.2	5%	1/4W
R4041	1-249-385-11	CARBON	2.2	5%	1/4W

KB

* **A-1404-859-A KB BOARD, MOUNTED**

NOTE: THIS IS A CONNECTOR BOARD. THERE ARE NO INDIVIDUAL PARTS.

REF. NO.	PART NO.	DESCRIPTION	VALUES
	ACCESSORIES AND PACKING		
	1-417-182-11	MATCHING TRANSFORMER, ANTENNA	
	1-501-730-41	ANTENNA, TELESCOPIC	
*	4-041-255-23	BAG, PROTECTION	
*	4-093-958-01	CARTON, INDIVIDUAL	
*	4-093-959-01	CUSHION, LOWER	
*	4-093-960-01	CUSHION, UPPER	
	4-093-925-41	MANUAL, INSTRUCTION	
	REMOTE COMMANDER		
	1-476-680-12	REMOTE COMMANDER (RM-Y180)	
	4-978-977-11	BATTERY COVER (for RM-Y180)	

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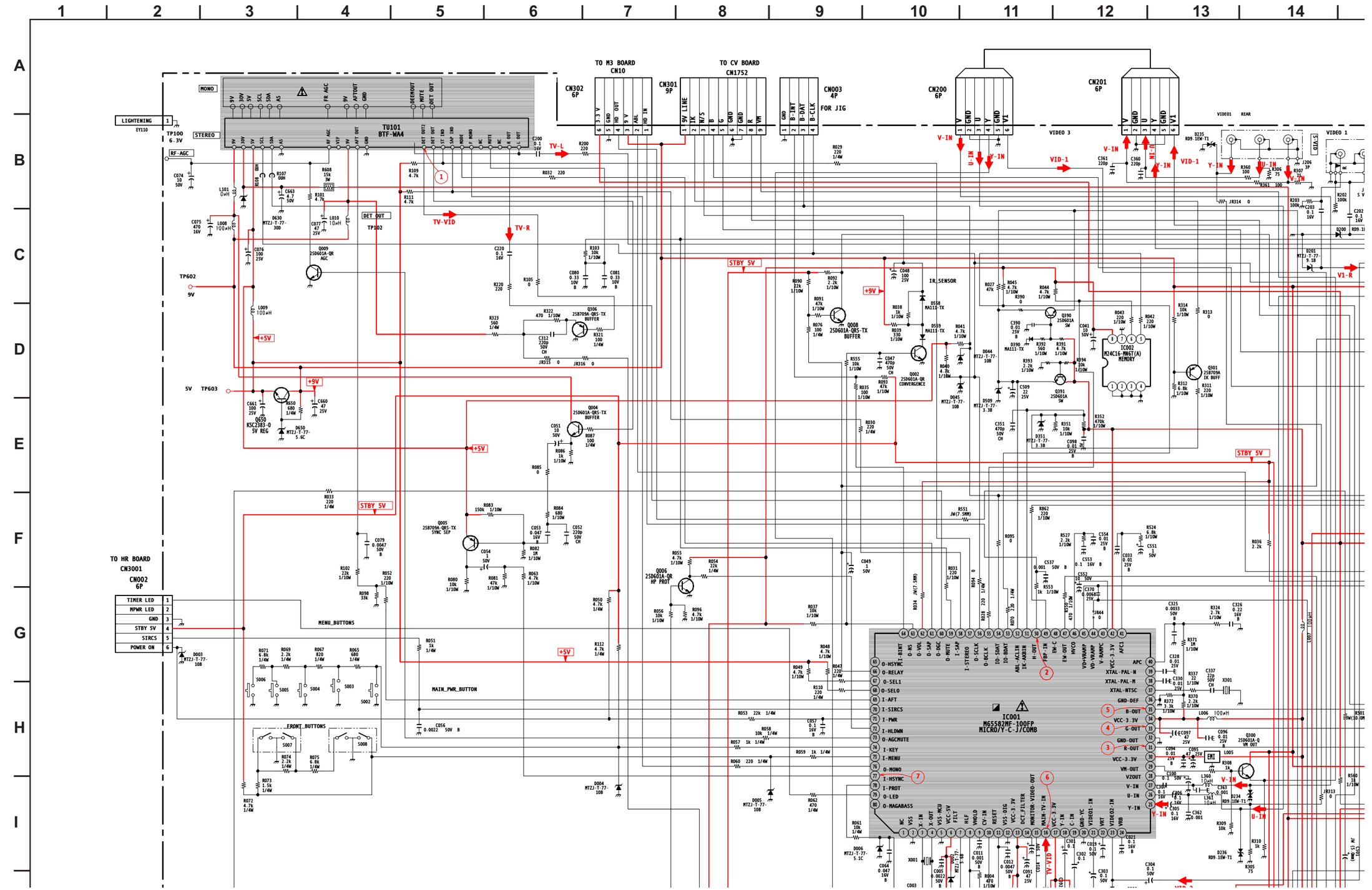
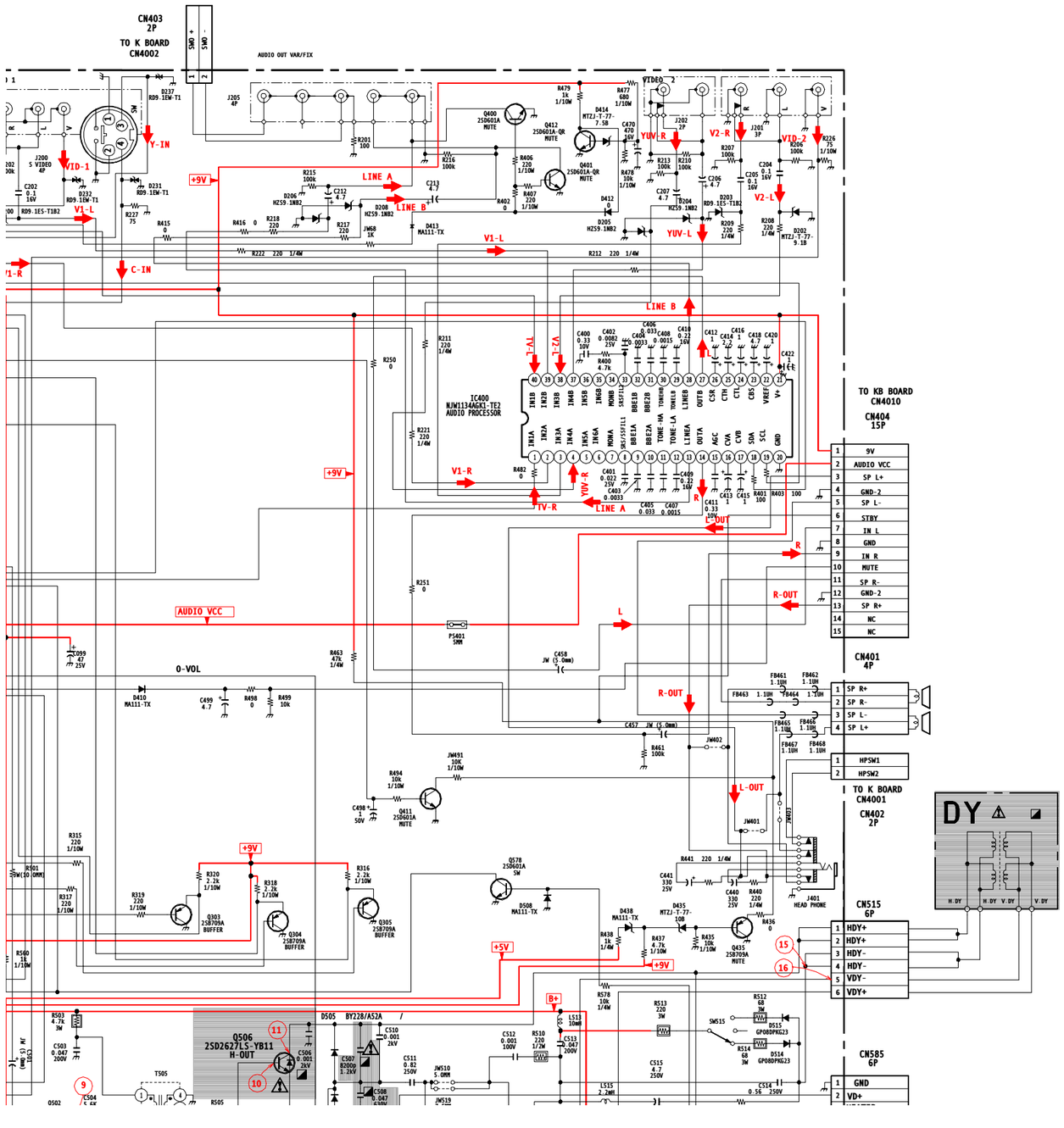
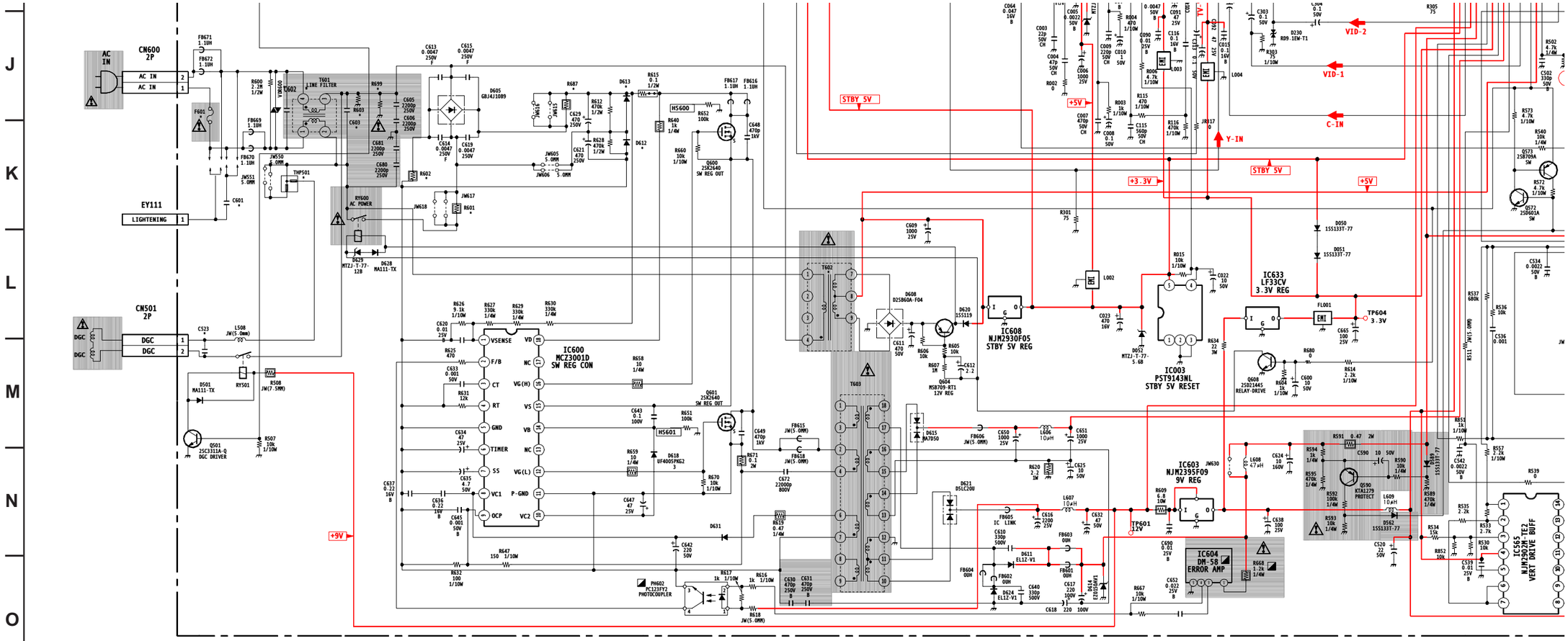
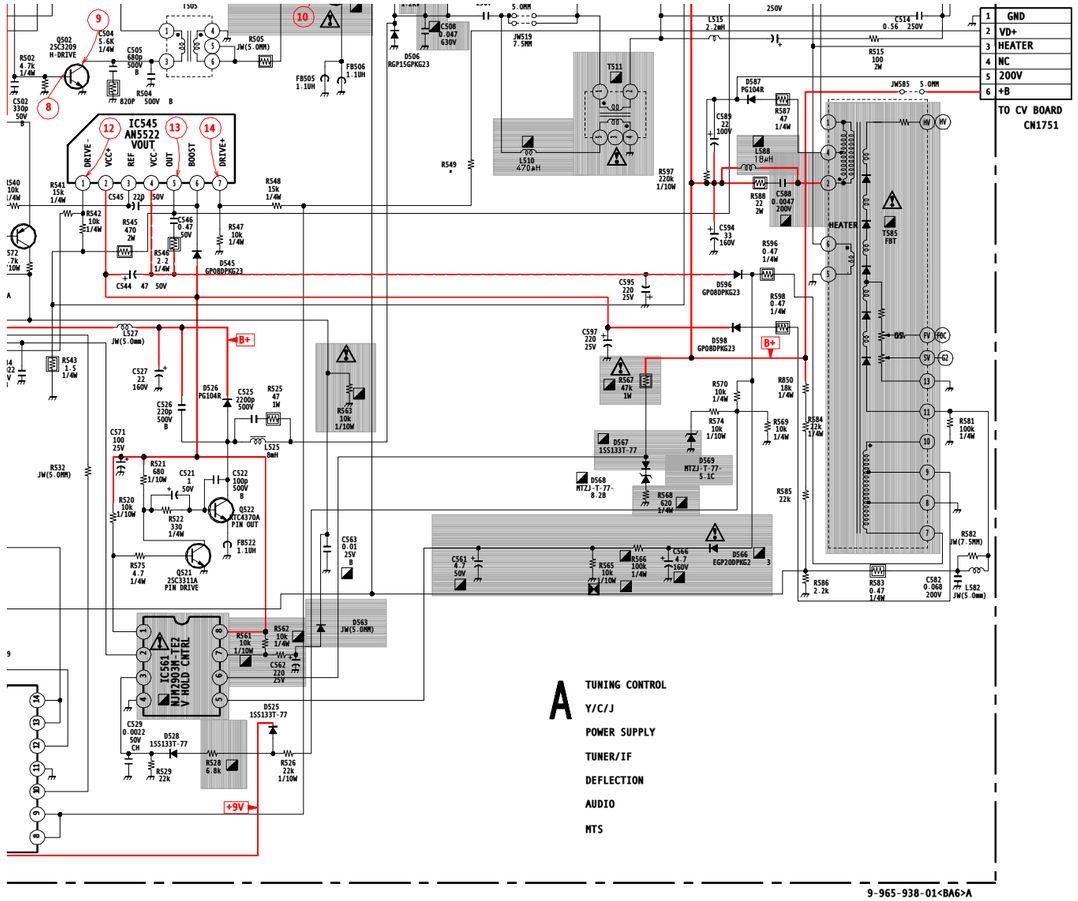
A BOARD SCHEMATIC DIAGRAM




15
16
17
18
19
20
21
22
CN403
2P
TO K BOARD
CN4002
SND +
SND -
AUDIO OUT VAR/FIX
Y-IN
VID-1
V1-L
C-IN
V1-R
+9V
LINE A
LINE B
VIDEO 2
YUV-R
V2-R
VID-2
V2-L
YUV-L
IC400
NJW1134AGK1-TE2
AUDIO PROCESSOR
V1-L
V2-L
V1-R
Y/V-R
T/V-R
LINE A
LINE B
L-OUT
R-OUT
L
R
TO KB BOARD
CN4010
CN404
15P
1 9V
2 AUDIO VCC
3 SP L+
4 GND-2
5 SP L-
6 STBY
7 IN L
8 GND
9 IN R
10 MUTE
11 SP R-
12 GND-2
13 SP R+
14 NC
15 NC
AUDIO VCC
O-VOL
CN401
4P
1 SP R+
2 SP R-
3 SP L-
4 SP L+
1 HPSW1
2 HPSW2
TO K BOARD
CN4001
CN402
2P
J401
HEAD PHONE
DY
H.DY
H.DY
V.DY
V.DY
CN515
6P
1 HDY+
2 HDY+
3 HDY-
4 HDY-
5 VDY-
6 VDY+
CN585
6P
1 GND
2 VD+
Q506
2SD2627LS-YB11
H-OUT
D505 BY228/A52A
T505
B+
+5V
Q303
2SB709A
BUFFER
Q304
2SB709A
BUFFER
Q305
2SB709A
BUFFER
Q578
2SD601A
SW
D508
MA111-TX
Q435
2SB709A
MUTE
SW515
D515
GP08DPKG23
D514
GP08DPKG23


AC IN
CN600 2P
AC IN 2
AC IN 1
EY111
LIGHTENING 1
CN501 2P
DGC 1
DGC 2
IC600 MCZ3001D SW REG CON
VSENSE
F/B
CT
GND
TIMER
SS
VC1
OCP
VD
NC
VG(H)
VS
VB
NC
VG(L)
P-GND
VC2
IC608 NJM2930F05 STBY 5V REG
IC633 LF33CV 3.3V REG
IC003 PST9143NL STBY 5V RESET
IC603 NJM2395F09 9V REG
IC604 DM-58 ERROR AMP
IC563 NJM2505M TE2 VERT DRIVE BUFF
STBY 5V
+5V
+3.3V
+9V
Y-IN
C-IN
VID-2
VID-1
TP604 3.3V
TP601 12V


IC545
AN5522
VOUT
DRIVE-
VCC+
REF
VCC-
OUT
BOOST
DRIVE+
IC561
LA7840
V HOLD CNTRL
Q502
2SC3209
H-DRIVE
Q521
2SC3311A
PIN DRIVE
Q522
DTC470A
PIN OUT
T511
T585
FBT
HEATER
B+
+9V
5.0MM
250V
GND
VD+
HEATER
NC
200V
+B
TO CV BOARD
CN1751
A
TUNING CONTROL
Y/C/J
POWER SUPPLY
TUNER/IF
DEFLECTION
AUDIO
MTS

SERVICE MANUAL

BA-6 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
KV-21FA210	RM-Y180	LATIN NORTH	SCC-S60P-A
KV-21FA210	RM-Y180	LATIN SOUTH	SCC-S60Q-A

CORRECTION- 1

SUBJECT: REPLACED A BOARD TRANSISTOR VOLTAGE LIST (Q600, Q601)
REPLACED A BOARD IC VOLTAGE LIST (IC600)

Correct the service manual as shown.
File this Correction with the service manual.

☛ : Corrected Items

SECTION 5: DIAGRAMS

5-3. BLOCK DIAGRAM AND SCHEMATICS

A Board Transistor Voltage List (Page 34)

A Board IC Voltage List (Page 35)

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SONY®

9-965-938-91

SECTION 5: DIAGRAMS

5-3. BLOCK DIAGRAM AND SCHEMATICS (Page 34)

A BOARD TRANSISTOR VOLTAGE LIST

	B	C	E		B	C	E
Q002	0.0	2.0	GND	**Q405**	0.0	0.0	GND
Q004	3.8	9.0	4.4	**Q411**	0.0	5.8	GND
Q005	5.1	0.8	5.0	**Q412**	0.1	0.1	GND
Q006	0.0	0.0	GND	**Q435**	0.0	GND	5.8
Q008	0.0	2.6	GND	**Q501**	0.0	14.3	GND
Q009	0.0	5.2	GND	**Q502**	0.0	74.1	GND
Q301	3.6	2.1	3.6	**Q506**	0.0	131.8	0.0
Q303	3.6	GND	2.8	**Q521**	0.0	3.8	GND
Q304	3.6	GND	2.9	**Q522**	0.1	-2.1	0.0
Q305	3.6	GND	3.0	**Q572**	0.0	2.6	GND
Q306	5.5	GND	4.9	**Q573**	2.6	0.0	2.6
Q390	0.8	1.5	1.9	**Q578**	0.0	0.5	GND
Q391	0.6	3.3	1.5	**Q590**	133.7	0.0	134.2
Q400	0.0	0.1	GND	**Q604**	30.6	11.6	30.2
Q401	0.0	0.1	GND	**Q608**	0.0	6.7	GND
Q404	0.0	0.0	GND	**Q650**	5.8	9.0	5.0

All voltages are in V.

	D	G	S
Q600	340.0	160.0	156.0
Q601	155.0	4.9	0.0

SECTION 5: DIAGRAMS

5-3. BLOCK DIAGRAM AND SCHEMATICS (Page 35)

A BOARD IC VOLTAGE LIST

IC001		44	1.6	7	GND	3	-12.2	13	NC
PIN	VOLT	45	1.6	8	5.0	4	-13.3	14	163.9
1	N/C	46	2.3	IC003		5	0.2	15	153.8
2	GND	47	1.0	PIN	VOLT	6	13.8	16	158.2
3	2.2	48	N/C	1	N/C	7	0.7	17	NC
4	2.2	49	0.5	2	GND	IC561		18	340.0
5	GND	50	1.2	3	GND	PIN	VOLT	IC603	
6	5.0	51	2.0	4	5.0	1	0.1	PIN	VOLT
7	0.0	52	1.5	5	5.0	2	3.4	I	12.0
8	2.0	53	4.8	IC401		3	2.3	G	GND
9	0.3	54	4.8	PIN	VOLT	4	GND	O	9.0
10	2.1	55	4.8	1	4.5	5	9.2	IC604	
11	5.0	56	4.8	2	0.3	6	10.2	PIN	VOLT
12	GND	57	N/C	3	4.5	7	0.1	1	133.7
13	3.3	58	5.2	4	0.3	8	13.5	2	N/C
14	3.1	59	0.0	5	4.5	IC565		3	2.5
15	1.0	60	0.0	6	4.5	PIN	VOLT	4	11.3
16	1.5	61	0.0	7	0.0	1	3.4	5	GND
17	3.3	62	0.0	8	4.5	2	3.4	IC608	
18	0.5	63	1.4	9	4.5	3	2.1	PIN	VOLT
19	1.1	64	4.9	10	N/C	4	9.0	I	11.0
20	GND	65	4.9	11	4.4	5	1.0	O	5.0
21	0.5	66	0.0	12	0.0	6	1.0	G	GND
22	1.7	67	0.1	13	4.5	7	1.0	IC633	
23	0.5	68	0.1	14	9.0	8	1.6	PIN	VOLT
24	0.5	69	2.4	15	4.4	9	1.6	I	9.0
25	0.5	70	5.0	16	GND	10	1.6	G	GND
26	0.0	71	5.0	IC404		11	GND	O	3.3
27	0.0	72	0.1	PIN	VOLT	12	1.6		
28	2.1	73	0.0	1	14.6	13	1.6		
29	2.7	74	5.0	2	7.0	14	1.6		
30	3.3	75	5.0	3	GND	IC600			
31	2.9	76	5.0	4	7.0	PIN	VOLT		
32	GND	77	0.1	5	5.9	1	2.8		
33	2.8	78	0.0	6	0.0	2	1.9		
34	3.3	79	4.9	7	GND	3	2.3		
35	2.9	80	4.9	8	0.0	4	2.6		
36	GND	IC002		9	0.5	5	GND		
37	1.8	PIN	VOLT	10	7.2	6	0.0		
38	0.0	1	GND	11	GND	7	4.6		
39	0.1	2	GND	12	7.0	8	17.5		
40	2.0	3	GND	IC545		9	0.0		
41	1.6	4	GND	PIN	VOLT	10	10.6		
42	3.3	5	4.8	1	0.7	11	0.0		
43	N/C	6	4.8	2	13.5	12	4.9		

All voltages are in V.

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HISTORY INFORMATION FOR THE FOLLOWING MANUAL:

SERVICE MANUAL

BA-6 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
KV-20FA210	*RM-Y180*	*US*	*SCC-S61H-A*

NOTE: THIS MANUAL IS IDENTICAL TO 9-965-938-02 (ATTACHED) WITH THE FOLLOWING EXCEPTIONS:

☛: **NEW DATA**

Section 4 **CIRCUIT ADJUSTMENTS**

- **New ID Map Table.**

Section 6 **EXPLODED VIEWS**

- **New Exploded View data provided.**

Section 7 **ELECTRICAL PARTS LIST**

- **Use Latin North A Board (P/N A-1302-090-A).**
- **Use Latin South CV Board (P/N A-1400-981-A).**

ACCESSORIES AND PACKING

- **New data provided.**

NEW INSTRUCTION MANUAL INCLUDED

WEIXIUZHIJIA 维修之家

ORIGINAL MANUAL ISSUE DATE: 9/2003

REVISION DATE	REVISION TYPE	SUBJECT
9/2003	No revisions or updates are applicable at this time.	

TRINITRON® COLOR TELEVISION

SONY®

9-965-956-01

Self Diagnosis Supported model

SERVICE MANUAL

BA-6 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
KV-20FA210	*RM-Y180*	*US*	*SCC-S61H-A*

KV-20FA210

RM-Y180

TRINITRON® COLOR TELEVISION

SONY®

9-965-956-01

4-4. ID MAP TABLE

Model	Destination	ID-O	ID-1	ID-2	ID-3	ID-4	ID-5	ID-6	ID-7
KV-20FA210	US	89	23	231	35	128	48	0	150

4-5. A BOARD ADJUSTMENTS

H. FREQUENCY (FREE RUN) CHECK

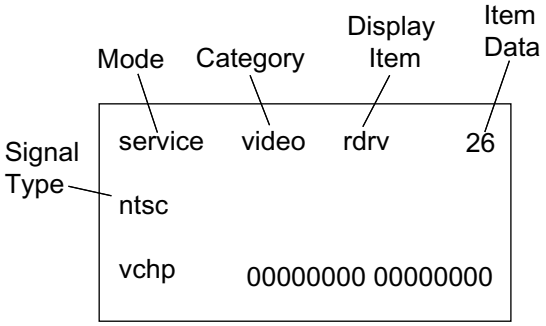
1. Input a TV mode (RF) with no signal.
2. Connect a frequency counter to base of Q502 (TP-25 H. DRIVE) on the A Board.
3. Check H. Frequency for 15735 ± 200 Hz.

V. FREQUENCY (FREE RUN) CHECK

1. Select video 1 with no signal input.
2. Set the conditions for a standard setting.
3. Connect the frequency counter to TP-27 (V OUT) or CN515 pin ⑥ (V DY+) and ground on the A Board .
4. Check that V. Frequency shows 60 ± 4 Hz.

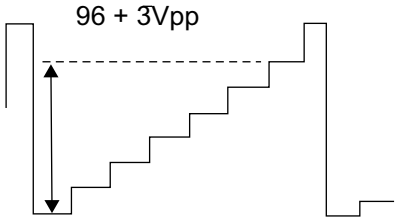
DRIVE (SCON)

1. Input a color-bar signal and set the level to 75%.
2. Set in Standard mode.
3. Activate the Service Adjustment Mode.
4. Set AALS, ABLS, GON and BON items. Using 3 and 6 set each to the following values. Leave RON set to "1".



AALS: OFF (0)
ABLS: OFF (1)
R ON: ON (1)
G ON: OFF (0)
B ON: OFF (0)

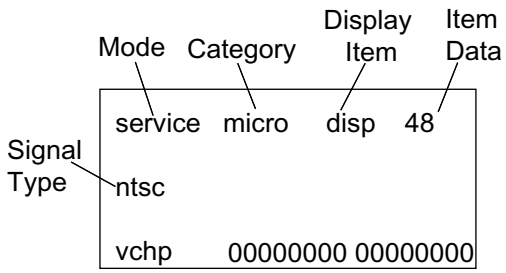
5. Connect an oscilloscope probe to CV Board, J1751Pin 12 (KR) (Red Out) .
6. Select SCON with 1 and 4 .
7. Adjust the value of SCON with 3 and 6 for 96 ± 3Vpp.



8. Reset AALS, ABLS, GON and BON values to "1".
   AALS: ON (1)
   ABLS: ON (0)
   R ON: ON (1)
   G ON: ON (1)
   B ON: ON (1)
9. Press MUTING then ENTER to save into the memory.

DISPLAY POSITION ADJUSTMENT (DISP)

1. Input a color-bar signal.
2. Set to Service Adjustment Mode.
3. Select DISP with 1 and 4 .
4. Adjust values of DISP with 3 and 6 to adjust characters to the center.
5. Write to memory by pressing MUTING then ENTER .
6. Check to see if the text is displayed on the screen.



SUB BRIGHT ADJUSTMENT (SBRT)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Select the SBRT item with 1 and 4 .
5. Adjust the values of SBRT with 3 and 6 to obtain a faintly visible crosshatch.
6. Press MUTING then ENTER to save into the memory.

SUB HUE, SUB COLOR ADJUSTMENT (SHUE, SCOL)

1. Input color-bar signal at 75%.
2. Activate the Service Adjustment Mode.
3. Set (PIC) to Max and (COL) to 50%.
4. Connect an oscilloscope probe to CV Board, CN301Pin ④ Blue Out.
5. Select the SHUE and SCOL item with 1 and 4 .
6. While showing the SHUE item, adjust the waveform with 1 and 4 until the second and third bars show the same level (V2 = V3 < 0.15Vp-p). Set Sub Hue -2 Step.

SECTION 6: EXPLODED VIEWS

Components not identified by a part number or description are not stocked because they are seldom required for routine service.

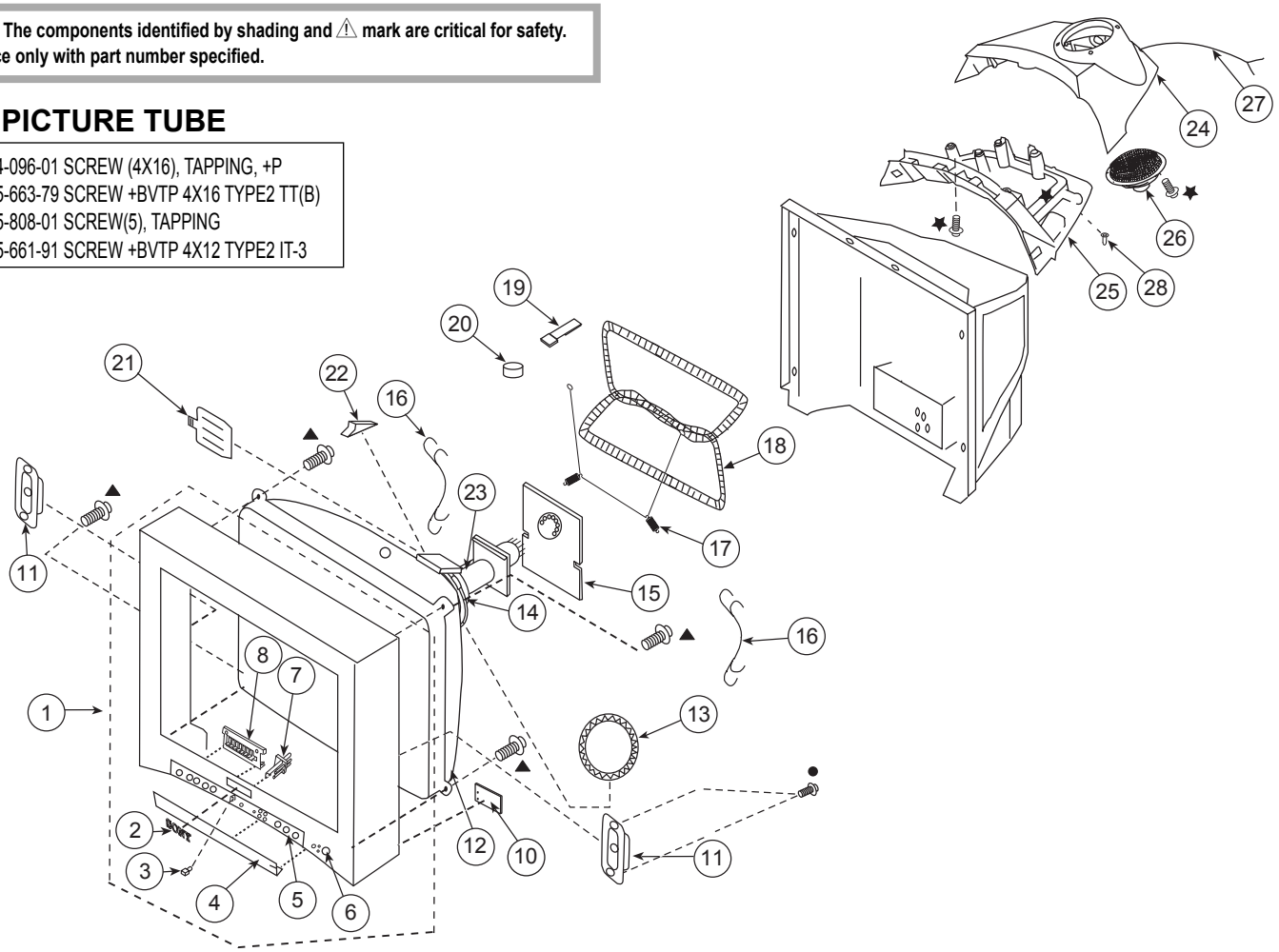
The component parts of an assembly are indicated by the reference numbers in the far right column of the parts list and within the dotted lines of the diagram.

*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

☛ 6-1. PICTURE TUBE

● 4-384-096-01 SCREW (4X16), TAPPING, +P
■ 7-685-663-79 SCREW +BVTP 4X16 TYPE2 TT(B)
▲ 4-365-808-01 SCREW(5), TAPPING
★ 7-685-661-91 SCREW +BVTP 4X12 TYPE2 IT-3

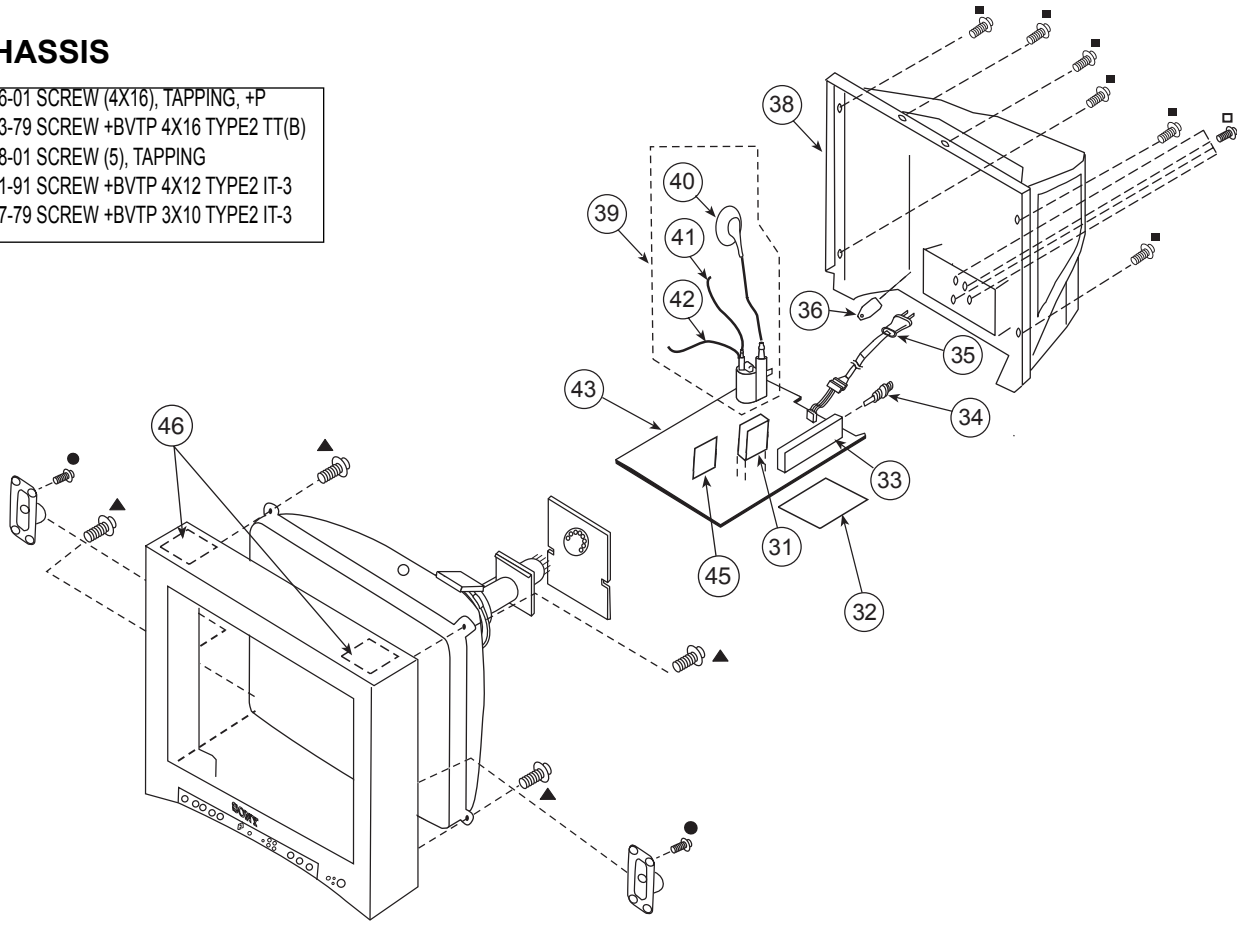


REF. NO.	PART NO.	DESCRIPTION	[Assembly Includes]
1	X-4039-877-4	BEZNET ASSY	(2-8)
2	4-046-161-11	EMBLEM, SONY NO.8	
3	4-042-192-01	CATCHER, PUSH	
4	4-087-155-11	DOOR, CONTROL	
5	4-074-895-71	LABEL, FRONT TERMINAL (20)	
6	4-087-150-01	BUTTON, POWER	
7	4-087-156-01	GUIDE, LIGHT	
8	4-087-151-01	BUTTON, MULTI	
* 10	A-1400-251-A	HR (COM) BOARD, MOUNTED	
11	1-825-425-21	LOUDSPEAKER 19.2CM 10W 8 OHMS	
⚠ 12	8-738-831-05	CRT 21RSN(SDP) (A51LPT50X)	
⚠ 13	1-456-285-11	NA ROTATION COIL (RT-A54)	
⚠ 14	8-451-505-71	DY Y21RSA-V	
* 15	A-1400-981-A	CV (VAR) BOARD, MOUNTED	
* 16	4-080-810-21	BAND, DEGAUSS COIL	
* 17	4-375-394-01	SPRING, TENSION	
⚠ 18	1-456-153-11	COIL, DEGAUSSING	
19	4-083-414-01	PIECE A(110), CONV CORRECT	
20	1-452-032-00	MAGNET,DISC	
21	4-057-714-01	PIECE ASSY, TLH CORRECTION	
22	4-053-005-01	SPACER, DY	
⚠ 23	1-451-561-21	NECK ASSEMBLY	
* 24	4-093-992-11	COVER, TOP WOOFER (21)	
* 25	4-093-993-01	COVER, BOTTOM WOOFER (21)	
26	1-825-424-11	LOUDSPEAKER 10CM 10W 4 OHMS	
* 27	1-827-198-11	CONNECTION CABLE	
* 28	4-068-528-01	FOOT	

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

☛ 6-2. CHASSIS

● 4-384-096-01 SCREW (4X16), TAPPING, +P
■ 7-685-663-79 SCREW +BVTP 4X16 TYPE2 TT(B)
▲ 4-365-808-01 SCREW (5), TAPPING
★ 7-685-661-91 SCREW +BVTP 4X12 TYPE2 IT-3
◘ 7-685-647-79 SCREW +BVTP 3X10 TYPE2 IT-3



	REF. NO.	PART NO.	DESCRIPTION [Assembly Includes]
	31	A-1404-859-A	KB BOARD, MOUNTED
*	32	A-1404-858-A	K BOARD, MOUNTED
⚠	33	8-598-593-50	TUNER FSS BTF-WA421
⚠	34	1-766-374-11	PLUG, F-PIN
⚠	35	1-824-069-11	CORD, AC POWER(WITH CONNECTOR)
*	36	4-081-980-11	HOLDER, AC CABLE
	38	4-087-153-04	COVER, REAR
⚠	39	1-453-316-21	FBT ASSY NX-1748//X4A4 (40-42)
⚠	40	1-251-642-52	CAP ASSY, HIGH-VOLTAGE
⚠	41	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD
⚠	42	1-900-803-22	WIRE ASSY, G2 LEAD

	REF. NO.	PART NO.	DESCRIPTION
	43	A-1302-090-A	A BOARD,COMPLETE
			The high-voltage leads associated with the FBT on this A Board are not included and must be ordered separately (See 40-42)
*	45	A-1400-738-A	M3 (VAR) BOARD, MOUNTED
	46	4-089-108-01	DAMPER, SOUND

SECTION 7: ELECTRICAL PARTS LIST

NOTE: The components identified by shading and ⚠ mark are critical for safety. Replace only with part number specified.

*** Items marked with an asterisk are not stocked since they are seldom required for routine service. Expect some delay when ordering these components.**

The components in this manual identified by the following symbol: ⋈ indicate parts that have been carefully factory-selected to satisfy regulations regarding X-ray radiation for each set.

Should replacement be required for one of these components, replace only with the value originally used.

RESISTORS
- **All resistors are in ohms**
- **F : nonflammable**
- **All variable and adjustable resistors have characteristic curve B, unless otherwise noted.**

When ordering parts by reference number, please include the board name.

A

REF. NO.	PART NO.	DESCRIPTION	VALUES
* ☛	**A-1302-090-A**	**A BOARD, COMPLETE (LATIN NORTH ONLY)**	
⚠	1-533-223-11	FUSE HOLDER	
	4-382-854-11	SCREW (M3X10), P, SW (+)	

The high-voltage leads associated with the FBT on the A board are not included and must be ordered separately. Order the following leads when requesting this A Board:

⚠	1-251-642-52	CAP ASSY, HIGH-VOLTAGE	
⚠	1-900-803-22	WIRE ASSY, G2 LEAD	
⚠	1-900-800-65	CONNECTOR ASSY, FOCUS LEAD	

CAPACITOR

C003	1-162-919-11	CERAMIC CHIP	22pF	5%	50V
C004	1-162-923-11	CERAMIC CHIP	47pF	5%	50V
C005	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C006	1-126-942-61	ELECT	1000µF	20%	25V
C007	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C008	1-126-956-91	ELECT	0.1µF	20%	50V
C009	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C010	1-126-960-11	ELECT	1µF	20%	50V
C011	1-162-964-11	CERAMIC CHIP	0.001µF	10%	50V
C012	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C014	1-126-960-11	ELECT	1µF	20%	50V
C015	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C019	1-126-956-91	ELECT	0.1µF	20%	50V
C021	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C022	1-126-964-11	ELECT	10µF	20%	50V
C023	1-126-935-11	ELECT	470µF	20%	16V
C033	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C041	1-126-964-11	ELECT	10µF	20%	50V
C047	1-164-315-11	CERAMIC CHIP	470pF	5%	50V
C048	1-104-665-11	ELECT	100µF	20%	25V
C049	1-126-960-11	ELECT	1µF	20%	50V
C051	1-126-964-11	ELECT	10µF	20%	50V
C052	1-164-230-11	CERAMIC CHIP	220pF	5%	50V
C053	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C054	1-126-960-11	ELECT	1µF	20%	50V
C056	1-162-966-11	CERAMIC CHIP	0.0022µF	10%	50V
C057	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C064	1-165-176-11	CERAMIC CHIP	0.047µF	10%	16V
C074	1-126-964-11	ELECT	10µF	20%	50V
C075	1-126-935-11	ELECT	470µF	20%	16V
C076	1-104-665-11	ELECT	100µF	20%	25V
C077	1-126-947-11	ELECT	47µF	20%	35V
C079	1-162-968-11	CERAMIC CHIP	0.0047µF	10%	50V
C080	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C081	1-128-934-91	CERAMIC CHIP	0.33µF	20%	10V
C090	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C091	1-126-947-11	ELECT	47µF	20%	35V
C092	1-126-947-11	ELECT	47µF	20%	35V
C094	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C095	1-126-947-11	ELECT	47µF	20%	35V
C096	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C097	1-126-947-11	ELECT	47µF	20%	35V
C098	1-162-970-11	CERAMIC CHIP	0.01µF	10%	25V
C099	1-126-947-11	ELECT	47µF	20%	35V
C100	1-126-956-91	ELECT	0.1µF	20%	50V
C115	1-164-739-11	CERAMIC CHIP	560pF	5%	50V
C116	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C200	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C202	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C203	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C204	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C205	1-107-826-11	CERAMIC CHIP	0.1µF	10%	16V
C206	1-126-963-11	ELECT	4.7µF	20%	50V

M3 HR CV

REF. NO.	PART NO.	DESCRIPTION	VALUES		
	RESISTOR				
R10	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W
R11	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W
R12	1-218-692-11	METAL CHIP	1K	0.50%	1/10W
R13	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W
R50	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R51	1-216-833-11	METAL CHIP	10K	5%	1/10W
R52	1-216-833-11	METAL CHIP	10K	5%	1/10W
R53	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R54	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R55	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R56	1-216-823-11	METAL CHIP	1.5K	5%	1/10W
R57	1-216-864-11	SHORT CHIP			
R58	1-216-835-11	METAL CHIP	15K	5%	1/10W
R59	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R70	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R71	1-218-716-11	METAL CHIP	10K	0.50%	1/10W
R72	1-218-700-11	METAL CHIP	2.2K	0.50%	1/10W
R74	1-218-740-11	METAL CHIP	100K	0.50%	1/10W
R75	1-218-740-11	METAL CHIP	100K	0.50%	1/10W
R76	1-218-732-11	METAL CHIP	47K	0.50%	1/10W
R77	1-218-740-11	METAL CHIP	100K	0.50%	1/10W
R78	1-208-814-91	METAL CHIP	22K	0.50%	1/10W
R79	1-208-798-11	METAL CHIP	4.7K	0.50%	1/10W

HR

*	**A-1400-251-A**	**HR (COM) BOARD, MOUNTED**	
	CAPACITOR		
C3001	1-104-665-11	ELECT	100µF 20% 25V
	CONNECTOR		
* CN3001	1-564-521-11	PLUG, CONNECTOR	6P
	DIODE		
D3002	8-719-057-09	DIODE	LNJ801LPDJA
	IC		
IC3001	8-742-211-20	HYB IC	SBX3071-71

REF. NO.	PART NO.	DESCRIPTION	VALUES		
	RESISTOR				
R3001	1-249-417-11	CARBON	1K	5%	1/4W
R3014	1-247-807-31	CARBON	100	5%	1/4W
	SWITCH				
S3006	1-786-338-11	SWITCH, TACTILE			

CV

* ☛	**A-1400-981-A**	**CV (VAR) BOARD, MOUNTED (LATIN SOUTH ONLY)**	
	4-382-854-11	SCREW (M3X10), P, SW (+)	
	CAPACITOR		
C780	1-162-926-11	CERAMIC CHIP	82pF 5% 50V
C781	1-162-926-11	CERAMIC CHIP	82pF 5% 50V
C782	1-162-926-11	CERAMIC CHIP	82pF 5% 50V
C901	1-107-667-11	ELECT	2.2µF 20% 400V
C902	1-130-491-00	MYLAR	0.047µF 5% 50V
C903	1-126-935-11	ELECT	470µF 20% 16V
C904	1-130-471-00	MYLAR	0.001µF 5% 50V
C905	1-106-383-00	MYLAR	0.047µF 10% 200V
C906	1-130-471-00	MYLAR	0.001µF 5% 50V
C907	1-107-638-11	ELECT	33µF 20% 160V
C908	1-126-935-11	ELECT	470µF 20% 16V
C909	1-161-830-00	CERAMIC	0.0047µF 500V
C910	1-104-999-11	MYLAR	0.1µF 5% 200V
C911	1-104-665-11	ELECT	100µF 20% 25V
C912	1-126-935-11	ELECT	470µF 20% 16V
C914	1-130-491-00	MYLAR	0.047µF 5% 50V
C915	1-162-970-11	CERAMIC CHIP	0.01µF 10% 25V
C1751	1-107-652-11	ELECT	10µF 20% 250V
C1752	1-162-114-00	CERAMIC	0.0047µF 2KV
C1753	1-137-528-11	MYLAR	0.1µF 10% 250V
C1754	1-102-074-00	CERAMIC	0.001µF 10% 50V
C1755	1-107-649-11	ELECT	2.2µF 20% 250V
C1774	1-126-947-11	ELECT	47µF 20% 35V
C1775	1-126-935-11	ELECT	470µF 20% 16V
C1777	1-126-963-11	ELECT	4.7µF 20% 50V
C1778	1-126-947-11	ELECT	47µF 20% 35V
	(LATIN SOUTH ONLY)		

K KB

REF. NO.	PART NO.	DESCRIPTION	VALUES		
	IC LINK				
PS4001	1-576-337-21	IC LINK	2.7A	50V	
PS4002	1-576-337-21	IC LINK	2.7A	50V	
	RESISTOR				
R4001	1-249-429-11	CARBON	10K	5%	1/4W
R4002	1-249-436-11	CARBON	39K	5%	1/4W
R4003	1-249-436-11	CARBON	39K	5%	1/4W
R4004	1-249-436-11	CARBON	39K	5%	1/4W
R4005	1-249-413-11	CARBON	470	5%	1/4W
R4006	1-249-413-11	CARBON	470	5%	1/4W
R4007	1-249-425-11	CARBON	4.7K	5%	1/4W
R4008	1-249-425-11	CARBON	4.7K	5%	1/4W
R4009	1-249-419-11	CARBON	1.5K	5%	1/4W
R4010	1-249-413-11	CARBON	470	5%	1/4W
R4011	1-249-425-11	CARBON	4.7K	5%	1/4W
R4017	1-249-385-11	CARBON	2.2	5%	1/4W
R4018	1-249-385-11	CARBON	2.2	5%	1/4W
R4019	1-249-425-11	CARBON	4.7K	5%	1/4W
R4020	1-249-385-11	CARBON	2.2	5%	1/4W
R4021	1-249-385-11	CARBON	2.2	5%	1/4W
R4022	1-249-421-11	CARBON	2.2K	5%	1/4W
R4023	1-249-421-11	CARBON	2.2K	5%	1/4W
R4024	1-249-441-11	CARBON	100K	5%	1/4W
R4025	1-249-441-11	CARBON	100K	5%	1/4W
R4026	1-249-429-11	CARBON	10K	5%	1/4W
R4027	1-249-429-11	CARBON	10K	5%	1/4W
R4028	1-249-385-11	CARBON	2.2	5%	1/4W
R4029	1-249-385-11	CARBON	2.2	5%	1/4W
R4030	1-249-425-11	CARBON	4.7K	5%	1/4W
R4031	1-249-433-11	CARBON	22K	5%	1/4W
R4032	1-249-433-11	CARBON	22K	5%	1/4W
R4040	1-249-385-11	CARBON	2.2	5%	1/4W
R4041	1-249-385-11	CARBON	2.2	5%	1/4W

KB

REF. NO.	PART NO.	DESCRIPTION
*	**A-1404-859-A**	**KB BOARD, MOUNTED**

NOTE: THIS IS A CONNECTOR BOARD. THERE ARE NO INDIVIDUAL PARTS.

ACCESSORIES AND PACKING

*	4-041-255-23	BAG, PROTECTION
*	4-100-636-01	CARTON, INDIVIDUAL
*	4-093-959-01	CUSHION, LOWER
*	4-093-960-01	CUSHION, UPPER
	4-100-519-21	MANUAL, INSTRUCTION

REMOTE COMMANDER

1-476-680-12	REMOTE COMMANDER (RM-Y180)
4-978-977-11	BATTERY COVER (for RM-Y180)

Sony Corporation
Sony Technology Center
Technical Services
Service Promotion Department

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SONY

4-100-519-**21**

FD Trinitron

WEGA®

Operating Instructions

KV-20FA210

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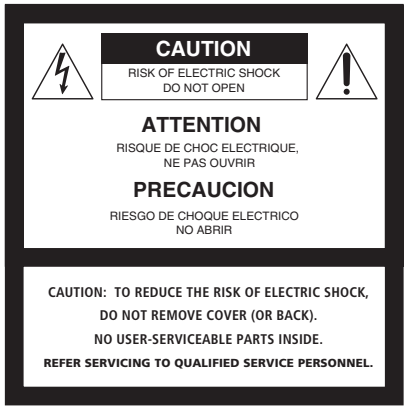
WARNING

To reduce the risk of fire or electric shock, do not expose the TV to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Note to the CATV Installer

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

SAFETY PRECAUTIONS

- ❏ Operate the TV only on 120 V AC.
- ❏ One blade of the power plug is wider than the other for safety purposes and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- ❏ If any liquid or solid object falls into the TV, unplug it and have it checked by qualified personnel before operating it further.

CAUTION

When using TV games, computers, and similar products with your TV, keep the brightness and contrast functions at low settings. If a fixed (non-moving) pattern is left on the screen for long periods of time at a high brightness or contrast setting, the image can be permanently imprinted onto the screen. Continuously watching the same channel can cause the imprint of station logos onto the TV screen. These types of imprints are not covered by your warranty because they are the results of misuse.

To reduce the risk of electric shock, do not use this polarized plug with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

NOTIFICATION

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ❏ Reorient or relocate the receiving antennas.
- ❏ Increase the separation between the equipment and receiver.
- ❏ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ❏ Consult the dealer or an experienced radio/TV technician for help.

Protecting the TV

- ❏ To prevent internal heat build-up, do not block the ventilation openings.
- ❏ Do not install the TV in a hot or humid place, or in a place subject to excessive dust or mechanical vibration.

Note on Caption Vision

This television receiver provides display of television closed captioning in accordance with § 15.119 of the FCC rules. Use of this television for other than private viewing of programs broadcast on UHF or VHF or transmitted by cable companies for the use of the general public may require authorization from the broadcaster-cable company and/or program owner.

Owner's Record

The model and serial numbers are located on the front cover of this manual and at the rear of your TV.

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ENERGY STAR® is a registered mark.

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IMPORTANT SAFEGUARDS

For your protection, please read these instructions completely, and keep this manual for future reference. Carefully observe and comply with all warnings, cautions and instructions placed on the set, or described in the operating instructions or service manual.

WARNING

To guard against injury, the following basic safety precautions should be observed in the installation, use, and servicing of the set.

Use

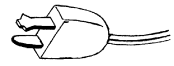
Power Sources

This set should be operated only from the type of power source indicated on the serial/model plate. If you are not sure of the type of electrical power supplied to your home, consult your dealer or local power company. For those sets designed to operate from battery power, refer to the operating instructions.

Grounding or Polarization

This set may be equipped with a polarized alternating current line plug (a plug having one blade wider than other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

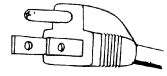
For the set with a polarized AC power cord plug



This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to have a suitable outlet installed. Do not defeat the safety purpose of the polarized plug by forcing it in.

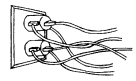
Alternate Warning

For the set with a three-wire grounding type AC plug



This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to have a suitable outlet installed. Do not defeat the safety purpose of the grounding plug.

Overloading



Do not overload wall outlets, extension cords or convenience receptacles beyond their capacity, since this can result in fire or electric shock.

Always turn the set off when it is not to be used. When the set is left unattended and unused for long periods of time, unplug it from the wall outlet as a precaution against the possibility of an internal malfunction that could create a fire hazard.

Do not disconnect the antenna or the power cord during a heavy storm. Lightning may strike while you are holding the cable or cord, causing serious injury. Turn off your TV and wait for the weather to improve.

Object and Liquid Entry

Never push objects of any kind into the set through the cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the set.

Attachments

Do not use attachments not recommended by the manufacturer, as they may cause hazards.

Do not place any objects, especially heavy objects, on top of the set. The object may fall from the set, causing injury.

Cleaning

Unplug the set from the wall outlet before cleaning or polishing it. Do not use liquid cleaners or aerosol cleaners. Use a cloth lightly dampened with water for cleaning the exterior of the set.

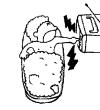
If a snapping or popping sound from a TV set is continuous or frequent while the TV is operating, unplug the TV and consult your dealer or service technician. It is normal for some TV sets to make occasional snapping or popping sounds, particularly when being turned on or off.

Installation

Always use two or more people to lift or move the set. The set is heavy and the bottom surface is flat. Serious injury can result from trying to move the set by yourself alone, or from unsteady handling.

Install the set on a stable, level surface.

Water and Moisture



Do not use power-line operated sets near water — for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, etc.

Accessories

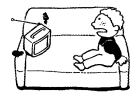
Do not place the set on an unstable cart, stand, tripod, bracket, table, or shelf. The set may fall, causing serious injury to a child or an adult, and serious damage to the set. Use only a cart or stand recommended by the manufacturer for the specific model of TV. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

Ventilation

The slots and openings in the cabinet and in the back or bottom are provided for necessary ventilation. To ensure reliable operation of the set, and to protect it from overheating, these slots and openings must never be blocked or covered.

- **Never cover the slots and openings with a cloth or other materials.**

- **Never block the slots and openings by placing the set on a bed, sofa, rug or other similar surface.**



- **Never place the set in a confined space, such as a bookcase or built-in cabinet, unless proper ventilation is provided.**

- **Do not place the set near or over a radiator or heat register, or where it is exposed to direct sunlight.**

Power-Cord Protection

Do not allow anything to rest on or roll over the power cord, and do not place the set where the power cord is subject to wear or abuse.

Antennas

Outdoor Antenna Grounding

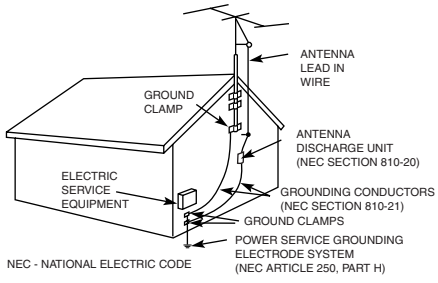
If an outdoor antenna is installed, follow the precautions below. An outdoor antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can come in contact with such power lines or circuits.

WHEN INSTALLING AN OUTDOOR ANTENNA SYSTEM, EXTREME CARE SHOULD BE TAKEN TO KEEP FROM CONTACTING SUCH POWER LINES OR CIRCUITS AS CONTACT WITH THEM IS ALMOST INVARIABLY FATAL.

Be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code (NEC) in USA and Section 54 of the Canadian Electrical Code in Canada provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

Antenna Grounding According to the NEC

Antenna Grounding According to the National Electrical Code, ANSI/NFPA 70.


ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ARTICLE 250, PART H)
NEC - NATIONAL ELECTRIC CODE

Lightning

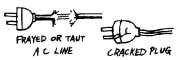
For added protection for this television receiver during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna. This will prevent damage to the receiver due to lightning and power-line surges.

Service

Damage Requiring Service

Unplug the set from the wall outlet and refer servicing to qualified service personnel under the following conditions:

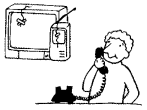
- **When the power cord or plug is damaged or frayed.**



- **If liquid has been spilled into the set or objects have fallen into the product.**

- **If the set has been exposed to rain or water.**

- **If the set has been subject to excessive shock by being dropped, or the cabinet has been damaged.**



- **If the set does not operate normally when following the operating instructions. Adjust only those controls that are specified in the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the set to normal operation.**

- **When the set exhibits a distinct change in performance — this indicates a need for service.**

Servicing

Do not attempt to service the set yourself since opening the cabinet may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

Replacement Parts

When replacement parts are required, be sure the service technician certifies in writing that he has used replacement parts specified by the manufacturer that have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock, or other hazards.

Safety Check

Upon completion of any service or repairs to the set, ask the service technician to perform routine safety checks (as specified by the manufacturer) to determine that the set is in safe operating condition, and to so certify. When the set reaches the end of its useful life, improper disposal could result in a picture tube implosion. Ask a qualified service technician to dispose of the set.

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Introduction

Congratulations on your purchase of the Sony FD Trinitron WEGA®.

Introducing the FD Trinitron WEGA® Features

Some of the features you will enjoy include:

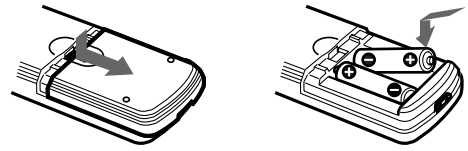
- ❏ **FD Trinitron Flat CRT** — Delivers a picture with uncompromising accuracy and outstanding image detail via a technologically advanced tube.
- ❏ **Dynamic Bass Response System** — Enhances low-frequency sounds with a powerful subwoofer. New and exclusive from Sony.
- ❏ **Y, P_B, P_R Inputs** — Provides component video inputs for superior picture quality (480i only).
- ❏ **WOW** — Provides a dramatic presence with a full, deep bass sound. When WOW is enabled, BBE is directly activated to further enhance the audio performance.
- ❏ **BBE** — Gives sound more impact by using audio technology to compensate for phase effects in speakers.
- ❏ **Surround** — Simulates theater quality sound for stereo programs.
- ❏ **Parental Control (V-Chip)** — Helps parents monitor what their children watch on TV by establishing rating limits.
- ❏ **Favorite Channels** — Provides instant access to your favorite channels with the touch of a button.
- ❏ **Info Banner** — Displays the name and the remaining time of the current program, if available.
- ❏ **Universal Remote Control** — Operates your connected cable box, VCR, digital satellite receiver, or DVD player.
- ❏ **Energy Star®** — Meets the Energy Star guidelines for energy efficiency.
- ❏ **Front Panel Controls** — Allows access to the on-screen menus without the use of a remote control.
- ❏ **Front A/V Inputs** — Lets you quickly connect video games, camcorders, or stereo/mono equipment.

About this Manual

This manual provides instructions to help you enjoy your new TV. It shows you how to connect to an antenna or cable, cable box, VCR, DVD, satellite receiver, stereo system, or camcorder. Once your TV is connected, follow the instructions and use the remote control to access the on-screen menus.

Batteries for the Remote Control

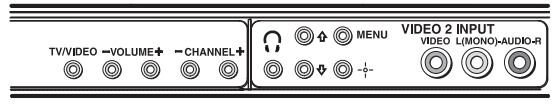
Insert two AA (R6) batteries (supplied) into the remote control using the following illustration as a guide.



✍ Under normal conditions, batteries will last up to six months. If the remote control does not operate properly, the batteries might be worn out.

✍ If you will not be using the remote control for an extended period of time, remove the batteries to avoid possible damage from battery leakage.

Front Panel Menu Controls



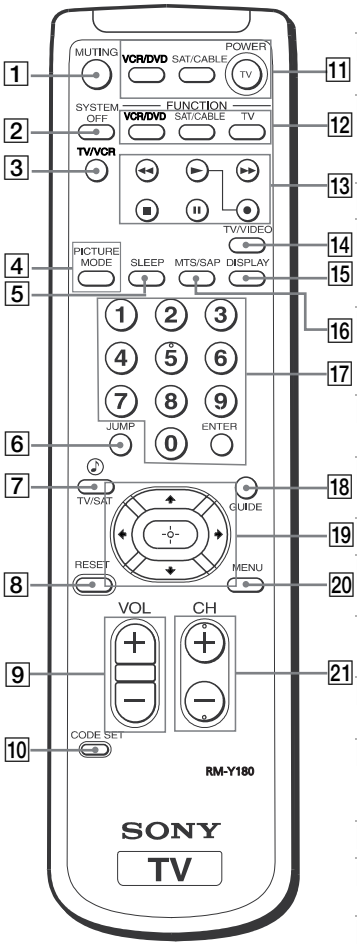
The front Audio/Video panel controls allow you to access the menu without the remote control.

- ❏ Press MENU to display the on-screen menu.
- ❏ Use the ⊕ and ⊕ buttons on the front Audio/Video panel instead of your remote control.
- ❏ Use the ⊕ button on the front Audio/Video panel to navigate through the menus, then select an item. The front panel controls also allow you to change your channels (CH+/-), adjust the volume (VOL +/-), and change video inputs.

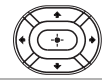
✍ To navigate the menus with your remote control, see "Using the Menus" on page 23.

Using the Remote Control

Remote Control Description



	Button	Description
1	**MUTING**	Instantly turns off the sound. Press again or press VOL + to restore the sound.
2	**SYSTEM OFF**	Powers off all Sony equipment at once (may not work with older equipment).
3	**TV/VCR**	Press when you are finished using a VCR and you want to switch to the TV Antenna input. Your VCR power will remain on.
4	**PICTURE MODE**	Cycles through the available Video Mode settings.
5	**SLEEP**	Turns the TV off automatically in approximately 15, 30, 45, 60 or 90 minutes. Cancel by pressing until Sleep Off appears.
6	**JUMP**	Press to jump back and forth between two channels. The TV alternates between current channel and the last channel that was selected.
7	TV/SAT	Press for a direct selection of Effect settings (Simulated, WOW, SRS, Off) (see page 26).
8	**RESET**	Press to return to factory settings while in an on-screen menu.
9	**VOL (volume)**	Press when you want to adjust the volume.
10	**CODE SET**	Use to program your remote control to operate connected video equipment (see page 5).
11	**POWER**	Press when you want to turn connected equipment on or off.
12	**FUNCTION**	Press when you want to control connected equipment with your remote control.
13	**VCR/DVD (operating)**	Operates VCR or DVD. Use when you want to operate connected VCR or DVD with your remote control.
14	**TV/VIDEO**	Press to cycle through available video inputs.
15	**DISPLAY**	Press once to show current time (if set) and channel number. Press again to turn DISPLAY off.
16	**MTS/SAP**	Cycles through the Multi-Channel TV Sound (MTS) options: Stereo, Mono, and Auto SAP (Second Audio Program).
17	**0-9 and ENTER**	Change the channels directly. Press 0-9 buttons to select a channel, then press ENTER.
18	**GUIDE**	Brings up the custom guide of your satellite receiver.

	Button	Description
19		Moves the cursor in the on-screen menus. Press the arrow buttons to move the cursor. Press the center button to select or access an option.
20	**MENU**	Displays the on-screen menu. Press again to exit the menu at any time.
21	**CH (channel)**	Press when you want to change channels.

✍ If you lose your remote control, see page 40.

Programming the Remote Control

In order to use your remote control with other equipment, you need to program your remote control. Use the following procedure to program the remote control.

1. Check the list of "Manufacturer's Codes" on page 6 and find the three-digit code number for the manufacturer of your component. If more than one code number is listed, use the number listed first.
2. Press CODE SET.

> ✍ The VCR/DVD and SAT/CABLE button will flash when you press CODE SET.

3. Press VCR/DVD or SAT/CABLE button to indicate the type of component you want to program with the remote control.

> ✍ You must do step 4 within 10 seconds of step 3, or you must redo steps 2 and 3.

4. Use the 0-9 buttons to enter the three-digit manufacturer's code number.
5. Press ENTER.
6. To check if the code number works, aim the TV's remote control at the component and press on the green POWER button (VCR/DVD, SAT/CABLE, TV) that corresponds with that component. If it responds, you are done. If not try using another code listed for that manufacturer.

> ✍ If you have problems programming your remote control, see "Troubleshooting" on page 39.

Manufacturer's Codes

VCRs

Manufacturer	Code
Sony	301, 302, 303
Admiral (M. Ward)	327
Aiwa	338, 344
Audio Dynamic	314, 337
Broksonic	319, 317
Canon	309, 308
Citizen	332
Craig	302, 332
Criterion	315
Curtis Mathes	304, 338, 309
Daewoo	341, 312, 309
DBX	314, 336, 337
Dimensia	304
Emerson	319, 320, 316, 317, 318, 341
Fisher	330, 335
Funai	338
General Electric	329, 304, 309
Go Video	322, 339, 340
Goldstar	332
Hitachi	306, 304, 305, 338
Instant Replay	309, 308
JC Penney	309, 305, 304, 330, 314, 336, 337
JVC	314, 336, 337, 345, 346, 347
Kenwood	314, 336, 332, 337
LXI (Sears)	332, 305, 330, 335, 338
Magnavox	308, 309, 310
Marantz	314, 336, 337
Marta	332
Memorex	309, 335
Minolta	305, 304
Mitsubishi/ MGA	323, 324, 325, 326
Multitech	325, 338, 321
NEC	314, 336, 337
Olympic	309, 308
Optimus	327
Panasonic	308, 309, 306, 307
Pentax	305, 304
Philco	308, 309
Philips	308, 309, 310
Pioneer	308
Quasar	308, 309, 306
RCA/ PROSCAN	304, 305, 308, 309, 311, 312, 313, 310, 329
Realistic	309, 330, 328, 335, 324, 338
Sansui	314
Samsung	322, 313, 321
Sanyo	330, 335
Scott	312, 313, 321, 335, 323, 324, 325, 326
Sharp	327, 328
Shintom	315
Signature 2000 (M. Ward)	338, 327
SV2000	338
Sylvania	308, 309, 338, 310
Symphonic	338
Tashiro	332
Tatung	314, 336, 337
Teac	314, 336, 338, 337
Technics	309, 308
Toshiba	312, 311
Wards	327, 328, 335, 331, 332
Yamaha	314, 330, 336, 337
Zenith	331

Laserdisc Players

Manufacturer	Code
Sony	701
Panasonic	704, 710
Pioneer	702

DVD Players

Manufacturer	Code
Sony	751
Hitachi	758
JVC	756
Magnavox	757
Mitsubishi	761
Onkyo	762
Oritron	759
Panasonic	753
Philips	757
Pioneer	752
RCA	755
Samsung	758
Toshiba	754
Zenith	760

Cable Boxes

Manufacturer	Code
Sony	230
Hamlin/Regal	222, 223, 224, 225, 226
Jerrold/G.I./ Motorola	201, 202, 203, 204, 205, 206, 207, 208, 218
Oak	227, 228, 229
Panasonic	219, 220, 221
Pioneer	214, 215
Scientific Altanta	209, 210, 211
Tocom	216, 217
Zenith	212, 213

Satellite Receivers

Manufacturer	Code
Sony	801
DIRECT TV	809
Dish Network	810
Echostar	810
General Electric	802
Hitachi	805
Hughes	804
Mitsubishi	809
Panasonic	803
RCA/ PROSCAN	802, 808
Toshiba	806, 807

Using your TV Remote Control with Other Equipment

Operating a VCR

Press	To
VCR/DVD	Power on the VCR (VCR/DVD green button)
0-9	Select a channel
CH + CH −	Change channels
►	Play video tape
■	Stop
◄◄ or ►►	Search forward or backward
❚❚	Pause
● and ►	Record
TV/VCR	Switch between VCR and TV inputs

Operating a DVD Player

Press	To
VCR/DVD	Power on the DVD (VCR/DVD green button)
0-9	Select chapters
CH + CH −	Search chapters forward or backward
►	Play DVD
■	Stop
❚❚	Pause
MENU	Display the DVD menu
	Use the arrow buttons to move the cursor in the menu, and the center button to select an option

Operating a Laser Disc Player

Press	To
VCR/DVD	Power on the laser disc (VCR/DVD green button)
CH + CH −	Search chapters forward or backward
►	Play disc
■	Stop
❚❚	Pause

Operating a Satellite Receiver

Press	To
SAT/CABLE	Power on the satellite receiver (SAT/CABLE green button)
0-9	Select a channel
CH + / CH −	Change channels
JUMP	Back to previous channel
DISPLAY	Display channel number
GUIDE	Display SAT GUIDE
MENU	Display SAT Menu
	Use the arrow buttons to move the cursor in the menu, and the center button to select an option

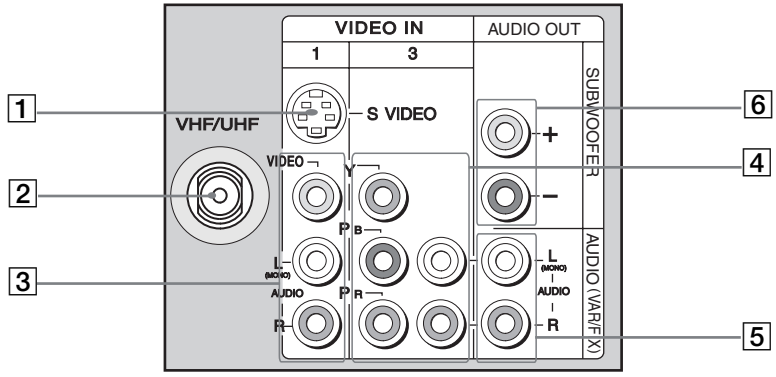
Operating a Cable Box

Press	To
SAT/CABLE	Power on the cable box (SAT/CABLE green button)
0-9	Select a channel
CH + / CH −	Change channels
JUMP	Change back to previous channel

Connecting Your TV

Read this section before setting up your TV for the first time. This section explains how to make the basic connections and how to connect optional equipment.

TV Rear Panel



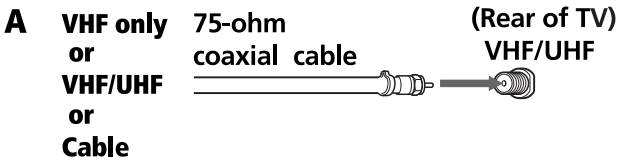
Jack	Description
1 **S VIDEO**	This input connects to the S VIDEO OUT jack on your VCR or other video equipment that has S VIDEO. S VIDEO provides better picture quality than the VHF/UHF jacks or the video input jack. S VIDEO does not provide sound, so you still must connect the audio cables.
2 **VHF/UHF**	This input connects to your VHF/UHF antenna or cable.
3 **AUDIO L(MONO), R/ VIDEO**	This input connects to the AUDIO/VIDEO output jacks on your VCR or other video equipment. A third video input jack (VIDEO 2) is located on the front panel of the TV. These AUDIO/VIDEO input jacks provide better picture quality than the VHF/UHF jack.
4 **Y, P_B, P_R/ L(MONO), R**	This input connects to the component video Y, P_B, P_R, and AUDIO L(MONO), R jacks on your DVD player or digital set-top box (480i only).
5 **AUDIO OUT (VAR/FIX) L(MONO), R**	This jack connects to the Audio input jacks on your audio equipment. You can listen to your TV's audio through your stereo system.
6 **Dynamic Bass Response System**	The Dynamic Bass Response System (subwoofer) accentuates the low frequencies for better overall sound.

Basic Connections

TV with Cable, Indoor, or Outdoor Antenna

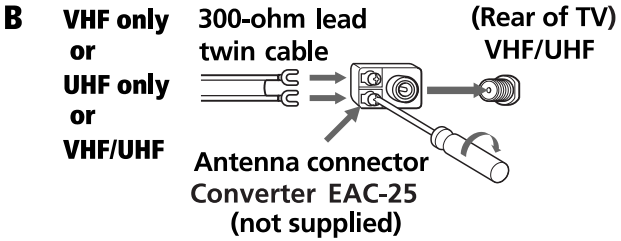
Depending on the cable system available in your home, choose one of the connections below:

A



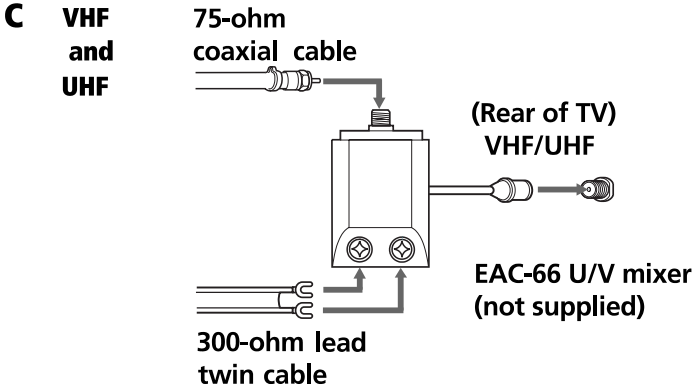
Use this to connect the TV to a cable system or an antenna with a 75-ohm cable (usually built in to newer homes).

B



Use this to connect the TV to a dipole antenna, also known as a "rabbit ears antenna" (usually found in older homes).

C



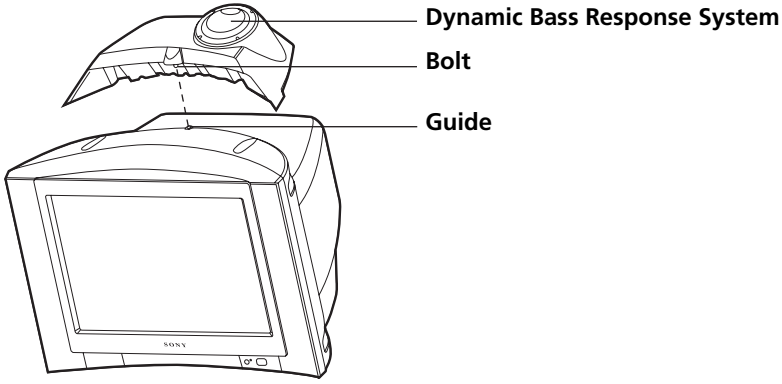
This allows you to connect your TV to both a cable system and a dipole antenna, in order to view both cable and local channels.

✍ If you are connecting to an indoor or outdoor antenna, you may need to adjust the orientation of the antenna for the best reception.

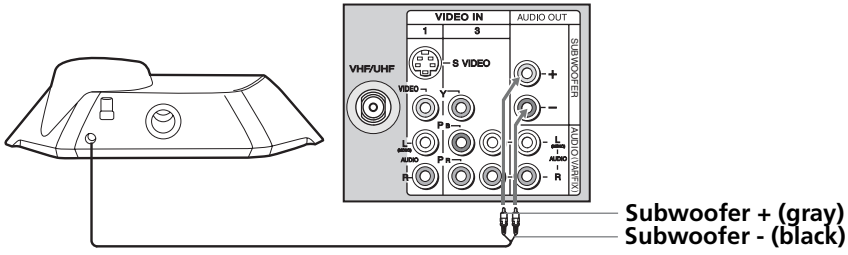
Dynamic Bass System Connection (Subwoofer)

- **Disconnect** the TV before connecting the Dynamic Bass Response System.
- Do **not** connect anything other than the KV-27FA210 Sony TV to the Dynamic Bass Response System (SUBWOOFER +/-) inputs.

1 Introduce the support bolt of the Dynamic Bass Response System into the guide located on top of the TV.

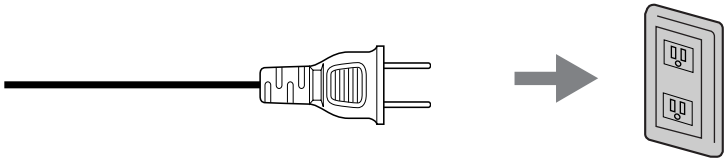


2 Connect the Dynamic Bass Response System cables (supplied) to the indicated inputs of the TV rear panel. Connect the gray cable to the SUBWOOFER + (gray input). Connect the black cable to the SUBWOOFER – (black input). See illustration below.



✍ Use only the supplied cables, otherwise your TV will not work.

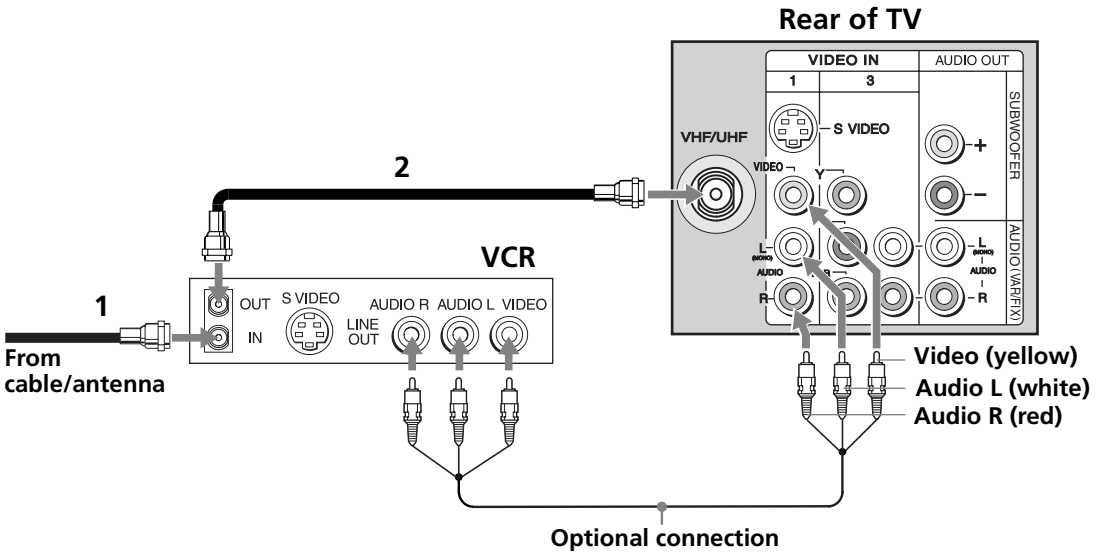
3 Once installation is complete, plug the TV's AC powercord into the wall socket.



✍ Do not plug in the AC powercord until the subwoofer is completely installed.

Connecting Additional Equipment

Connecting a TV and VCR



1 Connect the coaxial cable from your TV antenna or cable service to the IN jack on your VCR.

2 Connect a coaxial cable (not supplied) from the OUT jack on your VCR to the VHF/UHF jack on the TV.

Optional connection

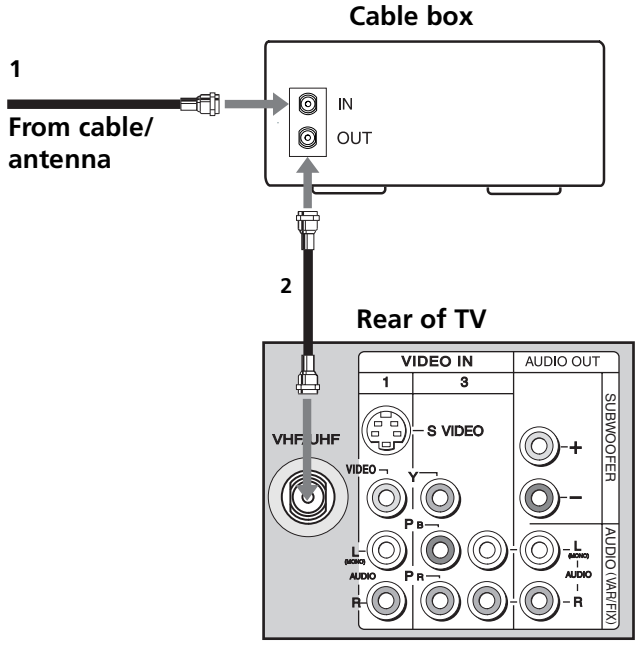
- If your VCR is equipped with video outputs, you can get better picture quality by connecting audio/video cables (not supplied) from AUDIO/VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.
- For better picture quality, use S VIDEO instead of the yellow video cable. S VIDEO does not provide sound, so you still must connect the audio cables.

Using your TV with this connection

This connection allows you to do the following:

- Program your Sony remote control to operate your VCR (see page 5).
- To activate your remote, press VCR/DVD to operate your VCR. To do this, first program your remote control, then use the Channel Fix feature to set your TV to channel 3 or 4 (see page 28).
- Press TV/VIDEO repeatedly to switch between VCR input (VIDEO input) and VHF/UHF (local channels).

TV and Cable Box



1 Connect the coaxial cable from your cable service to the IN jack on your cable box.

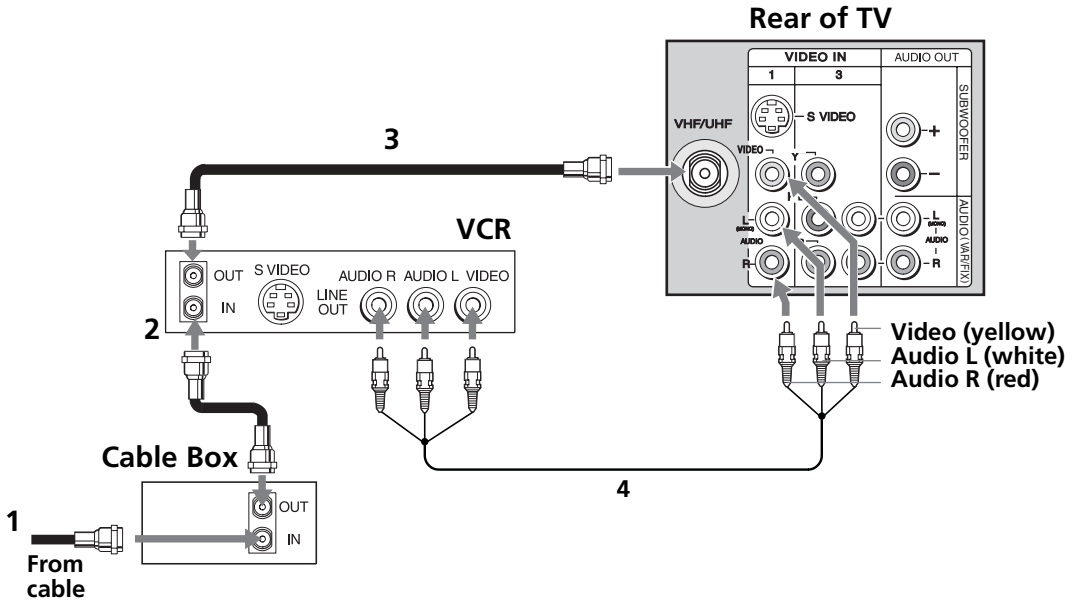
2 Connect a coaxial cable (not supplied) from the OUT jack on your cable box to the VHF/UHF jack on your TV.

Using your TV with this connection

This connection allows you to do the following:

- ❏ Program your Sony remote control to operate your cable box (see page 5).
- ❏ To activate your remote press SAT/CABLE to operate your cable box and then use the ⓪-⑨ buttons or CH+/- buttons to change the channels. To do this, first program your remote control, then use the Channel Fix feature to set your TV to channel 3 or 4 (see page 28).

TV, VCR, and Cable Box



1 Connect the coaxial cable from your cable service to the IN jack on your cable box.

2 Connect a coaxial cable (not supplied) from the OUT jack on your cable box to the IN jack on your VCR.

3 Connect a coaxial cable (not supplied) from the OUT jack on your VCR to the VHF/UHF jack on the TV.

4 If your VCR is equipped with video outputs, you can get better picture quality by connecting audio/video cables (not supplied) from AUDIO/VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.

Optional connection

❏ For better picture quality, use S VIDEO instead of the yellow video cable. S VIDEO does not provide sound, so you still must connect the audio cables.

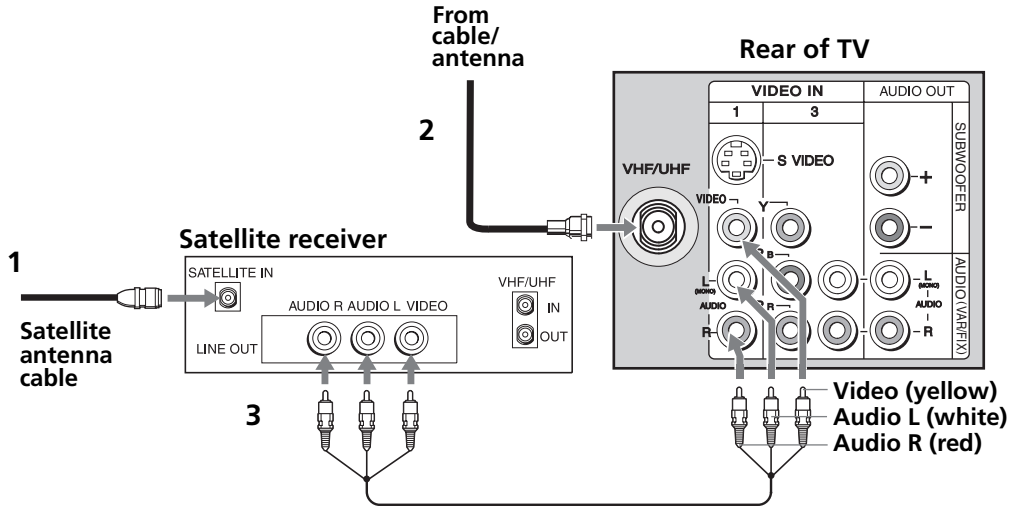
Using your TV with this connection

❏ Program your Sony remote control to operate your VCR or cable box (see page 5).

❏ To activate your remote, press VCR/DVD to operate your VCR or SAT/CABLE to operate your cable box. To do this, first program your remote control, then use the Channel Fix feature to set your TV to channel 3 or 4 (see page 28).

❏ Press TV/VIDEO repeatedly to switch between VCR input (VIDEO input), VHF/UHF (local channels or unscrambled), or cable box (cable system or scrambled channels).

Connecting a TV and Satellite Receiver



1 Connect the cable from your satellite antenna to SATELLITE IN on your satellite receiver.

2 Connect the coaxial cable from your cable service or antenna to the VHF/UHF jack on your TV.

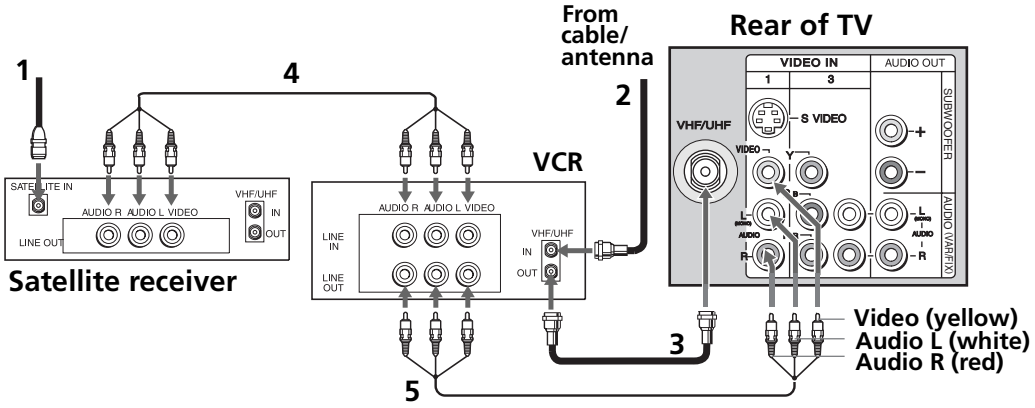
3 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your satellite receiver to AUDIO/VIDEO IN on your TV.

Using your TV with this connection

This connection allows you to do the following:

- ❏ Program your Sony remote control to operate your satellite receiver (see page 5).
- ❏ To activate your remote, press SAT/CABLE to operate your satellite receiver. See page 7 on how to operate other functions.
- ❏ Press TV/VIDEO repeatedly to switch to satellite receiver input (VIDEO input).

Connecting a TV, VCR, and Satellite Receiver



1 Connect the coaxial cable from your satellite antenna to SATELLITE IN on the satellite receiver.

2 Connect the coaxial cable from your cable service or antenna to the IN jack on your VCR.

3 Using a coaxial cable (not supplied), connect the OUT jack on your VCR to the VHF/UHF jack on your TV.

4 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your satellite receiver to AUDIO/VIDEO IN on your VCR.

5 Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.

✍ To view from the satellite receiver or VCR, select the video input to which your satellite receiver or VCR is connected by pressing TV/VIDEO on the remote control.

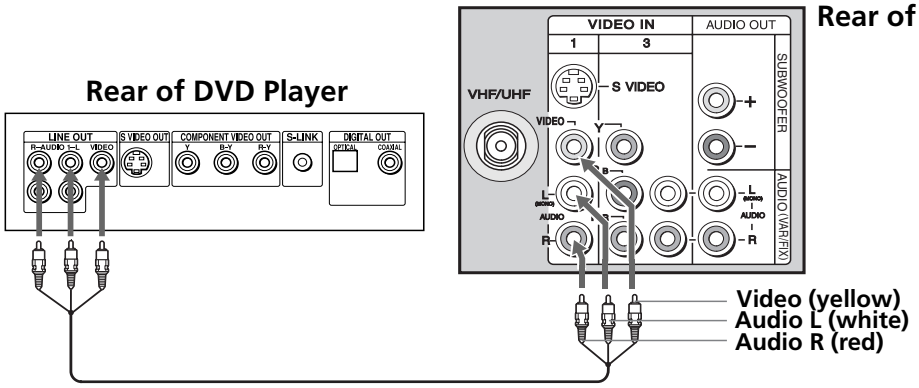
Using your TV with this connection

This connection allows you to do the following:

- ❏ Program your Sony remote control to operate your VCR or satellite receiver (see page 5).
- ❏ Turn on your VCR to enable your satellite receiver to work with this connection.
- ❏ To activate your remote, press VCR/DVD to operate your VCR or SAT/CABLE to operate your satellite receiver.
- ❏ Press TV/VIDEO repeatedly to switch between VCR input (VIDEO input), VHF/UHF (local channels or unscrambled), or your cable box (cable system or scrambled channels).

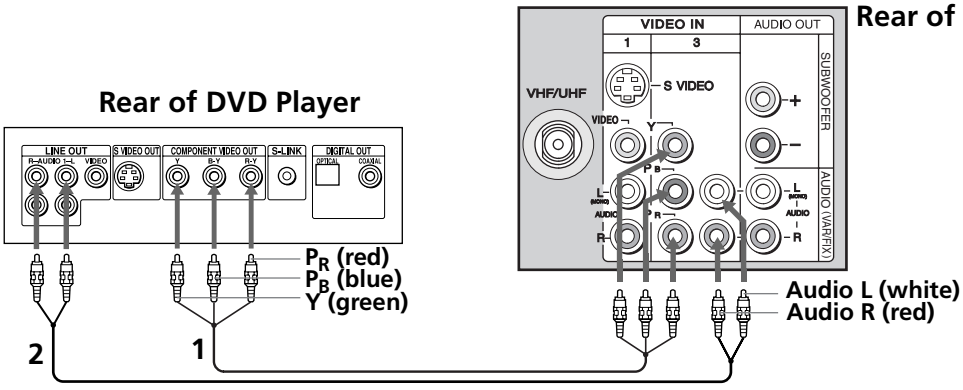
Connecting a DVD Player

Using audio/video cables (not supplied), connect AUDIO/VIDEO OUT on your DVD player to AUDIO/VIDEO IN on your TV.



Optional connection

- ❏ For better picture quality, use S VIDEO instead of the yellow video cable. S VIDEO does not provide sound, so you still must connect the audio cables.
- ❏ If your DVD player is equipped with component video outputs (Y, P_B, P_R), you can improve the picture quality by using component video cables (480i only).



1 Using component video cables (not supplied), connect the Y, P_B, P_R OUT on your DVD player to Y, P_B, P_R IN on your TV.

2 Connect AUDIO OUT on your DVD player to AUDIO IN on your TV.

✍ The Y, P_B, P_R outputs on your DVD player are sometimes labeled Y, C_B, and C_R or Y, B-Y, and R-Y. If so, connect the cables to like colors.

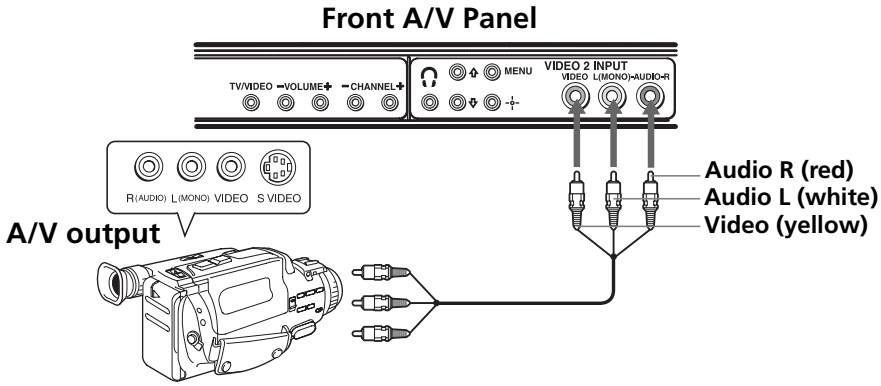
Using your TV with this connection

This connection allows you to do the following:

- ❏ Program your Sony remote control to operate your DVD (see page 5).
- ❏ To activate your remote, press VCR/DVD to operate your DVD.
- ❏ Press TV/VIDEO repeatedly to switch to the DVD player's input (VIDEO input).

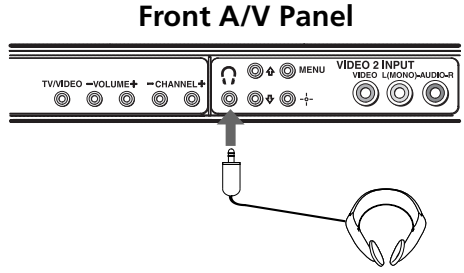
Connecting a Camcorder

To connect your camcorder, you can use the Audio/Video inputs on either the front or rear panel of the TV. Using the audio/video cables (not supplied), connect the AUDIO/VIDEO OUT on your camcorder to the AUDIO/VIDEO IN on your TV.



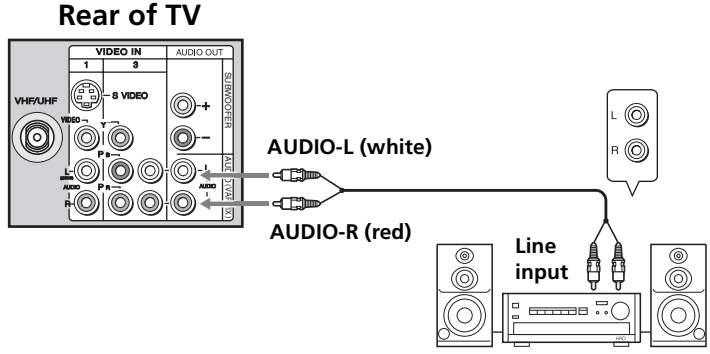
Connecting Headphones

Connect the headphones to the jack on the front Audio/Video panel. Headphone jack is STEREO.



Connecting an Audio System

1. Using audio/video cables (not supplied), connect AUDIO OUT on your TV to one of the unused line inputs (e.g. TV, AUX, TAPE2) on your stereo.
2. Set the Speaker option to Off. For more instructions, see “Using the Audio Menu“ on page 27.
3. Open the Audio Out option on the Audio Menu and select Fixed to control the volume through the connected audio system. For more instructions, see "Using the Audio Menu" on page 27.



Using Basic Functions

Setting Up the TV

After you have finished connecting your TV, you can use Auto Program to set up your channels. During Auto Program, the TV will automatically search for available channels and program receivable channels.

✍ When you start Auto Program wait until it is finished; otherwise it will skip over channels that are available. Perform Auto Program again to program receivable channels.

1 Press POWER to turn on the TV. The Initial Setup screen appears.

2 Press CH + on the remote control or on the TV front panel to start Auto Program, or press CH − to exit.

✍ The Initial Setup screen appears each time you turn on the TV until you perform Auto Program.

To perform Auto Program again

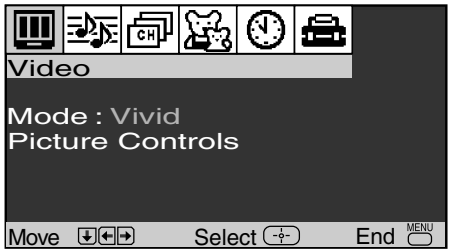
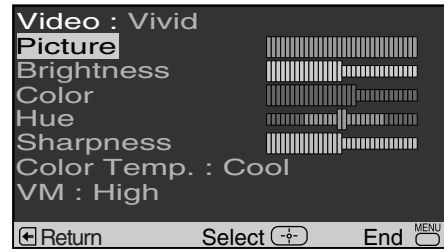
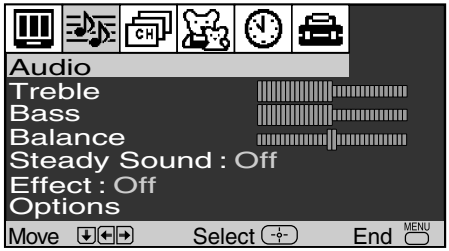
1 Press MENU.
2 Press → to highlight Channel Setup menu.
3 Press ↓ to highlight Cable. Press ⊕ to select.
4 Press ↑ or ↓ to highlight On or Off according to how you connected your TV. Press ⊕ to select.
5 Press ↓ to highlight Auto Program. Press ⊕ to search for channels.
6 After Auto Program finishes, press MENU to exit.

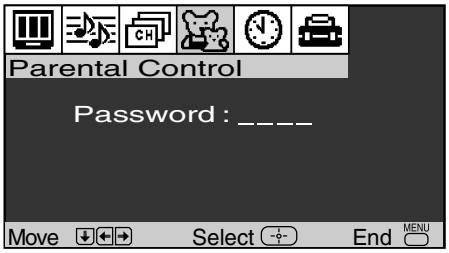
To reset the TV to factory settings

1 Turn the TV on.
2 Hold down RESET on the remote control.
3 Press and release the POWER button on the TV front panel. The TV will turn itself off, then back on.
4 Release RESET.

Quick Start to the Menus

The following settings are available in your on-screen menus:

Menu	Allows you to
	
	Adjust your picture settings.
	
	Change your audio settings.
	Customize your channel settings.

Menu	Allows you to
	Set rating limits on your TV based on program rating or content.
	Set the clock on your TV and program scheduled viewing using Timer 1 and Timer 2.
	Select captioning options, label video inputs, adjust tilt correction, select menu language, or run a demo of the menus.

Using the Menus

This section shows the options available for setting up and adjusting the TV.

How to Access Menus

To Access Menus

1. Press MENU to display the on-screen menu.
2. Use the ⇦ or ⇨ buttons to highlight the desired menu icon. Press ⊕ to select it.
3. Use the ⇧ or ⇩ buttons to scroll up and down through the features.
4. Follow the instructions on the screen.
5. For instructions on using a specific menu, see the page in this section that talks about that menu.
6. Press MENU to exit the menu.

✍ Press MENU once to display the on-screen menu, and press again to return to normal viewing. If no buttons are pressed, the menu closes automatically after about 90 seconds.

Using the Video Menu

To access the Video menu, use the following steps:

To Display **To Select**

Press ⇳ to highlight an option; then press ⊕.

Mode
Customized picture viewing

Use the ⇧or ⇳ buttons to highlight one of the following options, then press ⊕ to select it.

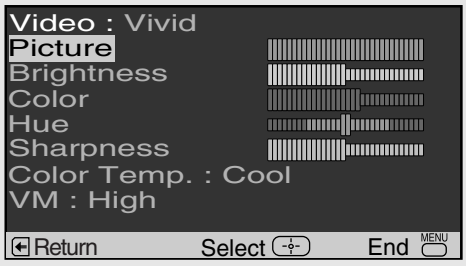
Vivid: Select for enhanced picture contrast and sharpness.
Standard: Select for a standard picture.
Movie: Select for a finely detailed picture.
Sports: Select for a bright picture.

✍ Press PICTURE MODE on the remote control for direct access to the picture modes (Vivid, Standard, Movie, Pro).

Picture Controls Menu (Video menu)

To access the Picture Controls menu, first open the Video menu by referring to the following steps:

To Display **To Select**



Press ⇩ to highlight Picture Controls, then press ⊕.

Picture:	Press ⇦ to decrease the contrast. Press ⇨ to increase contrast.
Brightness:	Press ⇦ to darken the picture. Press ⇨ to brighten the picture.
Color:	Press ⇦ to decrease color saturation. Press ⇨ to increase color saturation.
Hue:	Press ⇦ to increase the red tones. Press ⇨ to increase the green tones.
Sharpness:	Press ⇦ to soften the picture. Press ⇨ to sharpen the picture.
Color Temp. *White color tint adjustment*	Use the ⇧ or ⇩ buttons to highlight one of the following options, then press ⊕ to select it. **Cool:** Gives the white colors a blue tint. **Neutral:** Gives the white colors a neutral tint. **Warm:** Gives the white colors a red tint.
VM *Velocity Modulation*	Sharpens picture definition to give objects a crisp, clean edge. Use the ⇧ or ⇩ buttons to highlight one of the following options: **High**, **Low**, **Off**, then press ⊕ to select it.

Using the Audio Menu

To access the Audio menu, use the following steps:

Press ⇳ to highlight an option; then press ⊕.

Treble	Press ⇦ to decrease the higher pitched sounds. Press ⇨ to increase the higher pitched sounds.
Bass	Press ⇦ to decrease the lower pitched sounds. Press ⇨ to increase the lower pitched sounds.
Balance	Press ⇦ to emphasize the left speaker. Press ⇨ to emphasize the right speaker.
Steady Sound *Stabilizes volume*	Press ⇧ or ⇩ to select one of the following options, then press ⊕ to select it. **On:** Select to stabilize the volume when changing channels. **Off:** Select to turn Steady Sound off.
Effect	Use the ⇧ or ⇩ buttons to highlight one of the following options, then press ⊕ to select it. **Simulated:** Simulates stereo quality sound for mono programs. **WOW:** Provides a dramatic presence with a full, deep bass sound. When WOW is enabled, BBE is directly activated to further enhance the audio program. **SRS:** Produces a dynamic three dimensional sound for stereo audio signals. **Off:** Normal stereo or mono reception.

✍ Press TV/SAT to directly select Effect settings (Simulated, WOW, SRS, Off).

Options (Audio Menu)

To access the Options menu, first open the Audio menu by referring to the following steps:

To Display **To Highlight** **To Select**

Press ⇳ to highlight Options, then press ⊕.

MTS
Multi-Channel TV Sound

Use the ⇧ or ⇳ buttons to highlight one of the following options, then press ⊕ to select it.

Stereo: Select when viewing a broadcast in stereo.
Auto SAP: Select to have the TV automatically to a Second Audio Program (SAP) when a signal is received.
Mono: Select to reduce noise in areas of poor reception.

✍ Press MTS/SAP for direct MTS settings (Stereo, Auto SAP, Mono).

✍ If your TV is set to Auto SAP, some programs may be muted or distorted. If your TV does not output sound, change your Audio setting to Stereo or Mono.

Speaker
Custom selection of audio output source

Use the ⇧ or ⇳ buttons to highlight one of the following options, then press ⊕ to select it.

On: Select to listen to the sound from the TV speakers with or without a separate stereo system.
Off: Select to turn off the TV speakers and listen to the TV's sound only through external audio system speakers.

Audio Out
Use to control the TV's volume through a stereo

Use the ⇧ or ⇳ buttons to highlight one of the following options, then press ⊕ to select it.

Variable: Adjust the volume through your TV.
Fixed: Adjust the TV volume through a connected stereo.

✍ Audio Out settings can only be set when Speaker is set to Off.

Using the Channel Setup Menu

To access the Channel Setup menu, use the following steps:

Press ⇳ to highlight an option; then press ⊕.

Favorite Channels
Quick access to favorite channels

1. Use the ⇳ or ⇳ buttons to highlight the position (1-8) where you want to set a favorite channel, then press ⊕.
2. Use the ⇳ or ⇳ buttons to find the channel you want to add to your favorite channels.
3. Press ⊕ to select the channel. The TV will automatically change to the selected channel.
4. Press ⇦ to return to the Channel Setup menu or press MENU to exit.

✍ To use Favorite Channels, exit all menus and press ⊕. Press ⇳ or ⇳ to move the cursor to the desired channel number and press ⊕.

Cable

Use the ⇳ or ⇳ buttons to highlight one of the following options, then press ⊕ to select it.

On: Select if you are receiving cable channels with a CATV cable.
Off: Select if you are using a TV antenna.

✍ After changing your cable settings, you will need to perform Auto Program. See "To perform Auto Program again" on page 19.

Channel Fix

Use the ⇳ or ⇳ buttons to highlight one of the following options, then press ⊕ to select it.

Off: Channel Fix is not set.
2-6: Select when you want to control all channel selection through a cable box or VCR. Select the appropriate channel (usually 3 or 4) and use the cable box's or VCR's remote control for channel selection.
Video 1: Select from available video inputs when you have connected video equipment (e.g., a satellite receiver) and you want your TV fixed to it.

✍ You cannot use Favorite Channels, Cable, Channel Skip/Add, or Channel Label when Channel Fix is set.

Auto Program

Perform Auto Program whenever setting up your TV.
Auto Program will search for available channels and program receivable channels.

Channel Skip/Add

Use this feature after you run Auto Program to skip unwanted channels or add new ones.

1. Use the ⇧ or ⇩ buttons to highlight the position of the desired channel, then press ⊕.
2. Use the ⇧ or ⇩ buttons to highlight **Skip** or **Add,** then press ⊕.
3. Press ⇦ to return to the Channel Setup menu or press MENU to exit.

✍ Press CH + or CH - to skip over channels that have been skipped. You can still use the ⓪-⑨ buttons to directly tune to skipped channels.

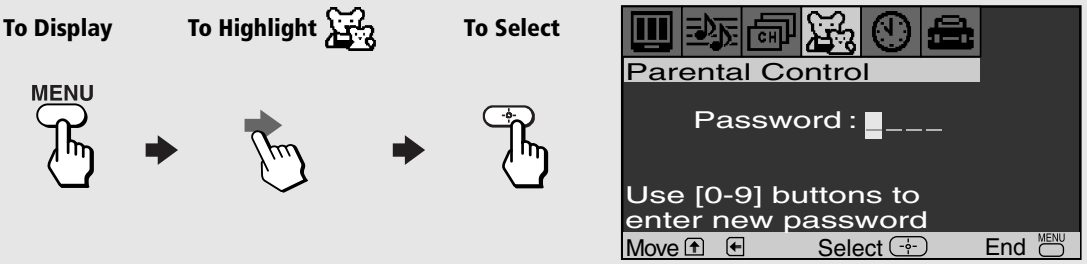
Channel Label

Label up to 40 channels with their call letters

1. Press ⊕, then use the ⇧ or ⇩ buttons until you reach the desired channel number.
2. Press ⊕ to activate the channel.
3. Press ⇩ to highlight **Label**, then press ⊕. Use the ⇧ or ⇩ buttons to display the first call letter or number of the label. Press ⊕ to select. Repeat this process until you finish selecting all the call letters.
4. When finished, press ⊕ to activate.
5. Press ⇦ to return to the Channel Setup menu or press MENU to exit.

Using the Parental Control Menu

To access the Parental Control menu, use the following steps:



The Parental Control feature helps parents monitor what their children watch on television.

To use the Parent Menu

When you select the Parental Control menu, you are prompted to set a 4-digit password. You cannot access the Parental Control menu settings without this password.

1 Use the ⓪-⑨ buttons to enter a 4-digit password.

2 Confirm your password by entering it again.

✍ Keep this manual in a safe place. You need your password for any future access to the Parental Control menu. If you forget your password, see page 39.

Parental Control

Setting the Rating

You can change the Rating by selecting one of the Lock options.

1 Press ⇩ to highlight **Lock;** then press ⊕.

If you are not familiar with Parental Guideline rating system, use one of the following preset categories to simplify the rating selection: Child, Youth, Young Adult.

2 Use the ⇧ or ⇩ to highlight the desired rating and press ⊕.

Rating	TV will allow a maximum rating of
Off	No rating limit
Child	TV-Y, TV-G, G (U.S.), G, C (Canada)
Youth	TV-PG, PG (U.S.), 8 ans + (Canada)
Young Adult	TV-14, PG-13 (U.S.), 14+ (Canada)
Custom	Select to set more restrictive ratings (see next section)

Changing your Password

1 Use the ⇧ or ⇩ buttons to highlight **Change Password** and press ⊕.

2 Follow steps 1 and 2 for “Using the Parental Control Menu” on page 30.

Select a Country

Select U.S.A. to use US ratings (see page 33-34) or select Canada to use Canadian ratings (see page 35). If you select a Country (U.S.A. or Canada) that is not where you live, the rating you select will not be activated.

1 Press ⇩ to highlight **Country**, then press ⊕.

2 Use the ⇧ or ⇩ to highlight the desired country and press ⊕.

Information for Parents

To view a program that exceeds the TV rating

❏ Press ENTER, then use the 0-9 buttons to enter your password.

✍ Entering your password to view a blocked program will temporarily turn **Lock** to Off. To reactivate your Lock settings, turn the TV off then back on; the TV will return to the settings that you have selected.

Using the Custom Menu

Follow the instructions on the screen to make your custom settings. Select the country desired for your TV's rating limit. See page 33 for U.S. models and page 35 for Canadian models for more information.

✍ Once you have blocked a rating or content, all higher ratings or content will be automatically blocked.

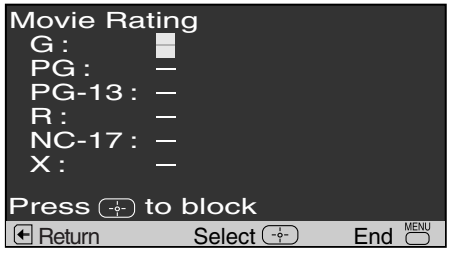
United States: Selecting Custom Rating Options

For the United States, the Custom Rating menu includes the following options: Movie Rating, TV Rating and Unrated. (For Canada, see page 35.)

Movie Rating

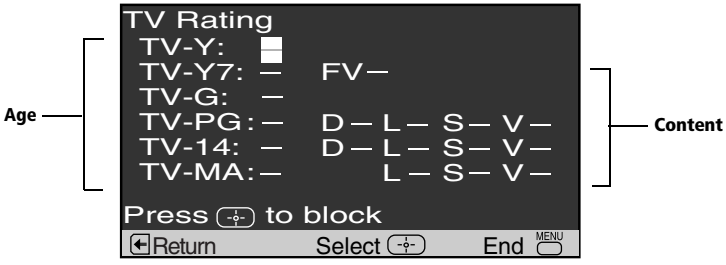
This system defines the rating levels of movies shown in theaters and on prime cable channels.

Rating	Defined as
G	General audience
PG	Parental guidance suggested
PG-13	Parents strongly cautioned
R	Restricted
NC-17	No one 17 and under admitted
X	Adult audience only



TV Rating

The TV rating is divided into two groups: age-based and content-based.



Age	Defined as
TV-Y	All children
TV-Y7	Directed to older children
TV-G	General audience
TV-PG	Parental guidance suggested
TV-14	Parents strongly cautioned
TV-MA	Mature audience only

Content	Defined as
FV	Fantasy violence
D	Suggestive dialogue
L	Strong language
S	Sexual situations
V	Violence

✍ The content ratings will increase depending on the level of the age-based rating. For example, a program with a TV-PG V (Violence) rating may contain moderate violence, while a TV-14 V (Violence) rating may contain intense violence.

Unrated

You have the option of blocking TV programs or movies that are not rated.

Allow	Allows all unrated programs
Block	Blocks all unrated programs

If you choose to block unrated TV programs, please be aware that the following programs may be blocked: emergency broadcasts, political programs, pro, news, public service announcements, religious programs, and weather.

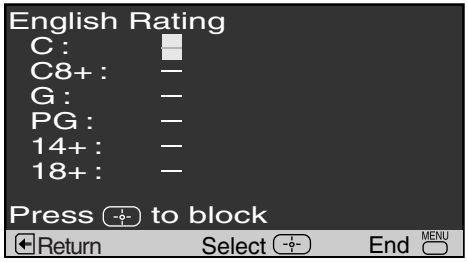
Canada: Selecting Custom Rating Options

For Canada, the Custom Rating menu includes the following options: English Rating, French Rating, and U.S.A. Rating.

English Rating

These ratings are for Canadian programs that are broadcast in English.

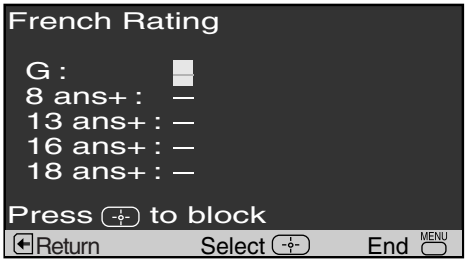
Rating	Defined as
C	Children
C8+	Children 8 years and older
G	General programming
PG	Parental guidance
14+	Viewers 14 and older
18+	Adult programming



French Rating

These ratings are for Canadian programs that are broadcast in French.

Rating	Defined as
G	General
8 ans+	Not recommended for younger children
13 ans+	Not recommended for children under age 13
16 ans+	Not recommended for ages under 16
18 ans+	This program is restricted to adults

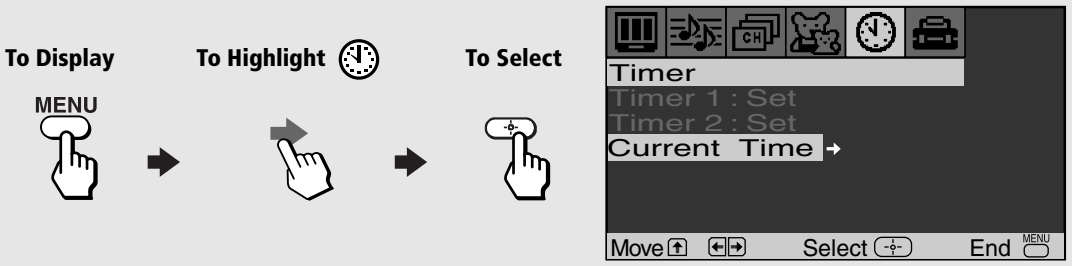


U.S.A. Rating

For programs from the United States, see “TV Rating” on page 33.

Using the Timer Menu

To access the Timer menu, use the following steps:



Current Time

Set your TV to the current day and time. Press ⊕ to open the Current Time menu:

1. Use the ⇧ or ⇩ buttons to enter the correct day and time, then press ⊕.
2. Press MENU to exit the menu.

✍ You must set the Current Time before you can use Timer 1 or Timer 2.

Timer 1 and Timer 2

Scheduled viewing

Use the timers to program your TV to turn on and off by day, time, duration, and channel. The timer duration is a maximum of six hours. When the channel is fixed, it is not necessary to set the channel.

1. Use the ⇧ or ⇩ buttons to highlight **Timer 1** or **Timer 2**, then press ⊕.
2. Use the ⇧ or ⇩ buttons to enter the desired day, start time, duration, and channel, then press ⊕. The timer status should be On when the Timer has been set, and the timer light on the front panel of the TV should be on.
3. Press MENU to exit the menu.

✍ Select Off to turn off the Timer. Your previous settings will be saved.

✍ When you perform Auto Program, Timer 1 and Timer 2 settings will be cleared. Also, in the event of any loss of power, Current Time, Timer 1, and Timer 2 settings will be cleared.

Using the Setup Menu

To access the Setup menu, use the following steps:

Press ⇩ to highlight an option; then press ⊕.

Caption Vision
Closed-Captioning

Allows you to select from three closed caption modes for programs that are broadcast with closed captioning.
Use the ⇧ or ⇩ buttons to highlight one of the following options, then press ⊕ to select it.

Off: Caption Vision is not activated.
CC1, 2, 3, 4: Displays printed dialogue and sound effects of a program.
Text1, 2, 3, 4: Displays network/station information.
XDS: Displays the name of the current program and its remaining time (if available) when you change the channel or press the DISPLAY button.

Video Label
Label connected equipment

Allows you to identify the video components connected to the TV: VCR, DVD, etc. When you press TV/VIDEO to switch inputs, the Video Label appears on-screen.

1 Press the ⇧ or ⇩ buttons to highlight the input you want to label and press ⊕.
2 Press the ⇧ or ⇩ buttons to highlight a label and press ⊕.
3 Press ⇦ to return to the Setup menu or press MENU to exit.

✍ If you select **Skip**, your TV skips this connection when you press the TV/VIDEO button.

Tilt Correction

Use the ⇧ or ⇩ buttons to set the tilt of the picture from –5 to +5, then press ⊕ to activate.

Language

Display all menus in the language of your choice.
Use the ⇧ or ⇩ buttons to select from one of the following options: **English, Español** (Spanish) and **Français** (French). Then press ⊕.

Demo

Press ⊕ to run a demonstration of the on-screen menus.

✍ You can press any button to exit Demo mode.

Remote Control

Problem	Possible Remedies
I cannot operate the remote control	❑ Press TV (FUNCTION) when operating your TV. ❑ Check the orientation of the batteries. ❑ Batteries could be weak. Replace them (page 2). ❑ Move the TV three to four feet away from fluorescent lights.
I cannot change channels with the remote control	❑ Make sure you have not inadvertently switched your TV from the channel 3 or 4 setting if you are using another device to change channels. ❑ If you are using another device to control channels, be sure that you have pressed the FUNCTION button for that device. For example, if you are using your VCR to control channels, be sure to press the VCR/DVD FUNCTION button (page 3).
I lost the remote control	❑ You can use the front panel controls to access your menus, change channels, adjust the volume, or change video inputs (page 2). Contact your nearest Sony Dealer to order a replacement, please call our Sony Direct Accessory and Part Center at 1-800-488-7669 (U.S. residents only).

Programming The Remote Control

Problem	Possible Remedies
More than one code is listed	❑ Try entering them one by one until you come to the correct code for your component.
I entered the wrong code number	❑ If you enter a new code number, the code number you previously entered at that setting is erased.
I cannot operate a component with the remote control	❑ Use the component's own remote control.
When I changed the batteries, the code numbers changed back to the factory settings	❑ You must reprogram the remote control (page 5).

Video

Problem	Possible Remedies
No picture, no sound	❏ Make sure the power cord is plugged in. ❏ If a red light is flashing on the front of your TV for more than a few minutes, disconnect and reconnect the power cord. If the problem continues, call your local service center. ❏ Check the TV/VIDEO setting: when watching TV, set it to TV; when watching video equipment, set it to VIDEO 1, 2, 3, 4 or 5 (page 3). ❏ Make sure you have inserted the batteries correctly into the remote control (page 2). ❏ Try another channel to rule out station trouble.
Poor or no picture, good sound	❏ Adjust the **Picture** setting in the Video menu (page 24). ❏ Adjust the **Brightness** setting in the Video menu (page 25). ❏ Check the antenna and/or cable connections (page 10).
No color	❏ Adjust the **Color** setting in the Video menu (page 24).
Only snow appears on the screen	❏ Check the **Cable** setting in the Channel Setup menu (page 28). ❏ Check the antenna and/or cable connections (page 10). ❏ Make sure the channel selected is currently broadcasting.
Dotted lines or stripes	❏ Adjust the antenna. ❏ Move the TV away from other electronic equipment. Some electronic equipment creates electrical noise, which can interfere with TV reception.
Double images or ghosts	❏ Check your outdoor antenna or call your cable service.

Audio

Problem	Possible Remedies
Good picture, no sound	❏ Press MUTING so that Muting disappears from the screen (page 3). ❏ Check your Audio settings. Your TV may be set to Auto SAP in the MTS feature (page 27). ❏ Make sure the speaker option is set to On in the Audio Menu. ❏ Press VOL to adjust your TV's volume.

Dynamic Bass Response System (Subwoofer)

Problem	Possible Remedies
No sound	❏ Check the SUBWOOFER +/- inputs on the rear panel of the TV to make sure the cables are connected correctly (see page 11).

Channels

Problem	Possible Remedies
I cannot receive higher number channels (UHF) when using an antenna	❑ Make sure **Cable** is set to Off in the Channel Setup menu (page 28). ❑ Perform Auto Program to add channels that are not presently in the memory (page 19).
Cable stations don't seem to work	❑ Make sure **Cable** is set to On in the Channel Setup menu (page 28). ❑ Perform Auto Program to add channels that are not presently in the memory (page 19).
I cannot get anything but TV	❑ Be sure that you did not set the video in the Setup menu (page 37) to skip your video inputs. If a video input has been set to **Skip**, it will be skipped when you press the TV/VIDEO button.

Contacting Sony

Before calling our Customer Information Services Center, reset the TV to factory settings (see page 21). Please have your TV serial number ready. The number is located on the rear of your TV and on the front cover of this manual.

Our Customer Information Services Center phone number is 1-800-222-SONY (7669) (US residents only) or (416) 499-SONY (7669) (Canadian residents only).

Specifications

Television system	American TV standard/NTSC			
Channel coverage	VHF: 2-13/UHF: 14-69/CATV: 1-125			
Antenna	75-ohm external antenna terminal for VHF/UHF			
Picture tube	FD Trinitron® tube			
Power requirements	120V, 60 Hz			
Supplied accessories	Size AA (R6) batteries (2) Remote Control RM-Y180 (1)			
Inputs/outputs	Inputs	1 video, 1 audio (front) 1 video, 1 audio (rear) 1 S VIDEO 1 RF 1 Y, PB, PR, 1 audio 1 headphone jack	Outputs	1 AUDIO OUT 1 Dynamic Bass Response System (Subwoofer)
Optional accessories	Connecting cables VMC-810S/820S, VMC-720M, YC-YC-15V/30V, RK74A EAC-66U/V mixer			
KV-20FA210				
Screen size	Visible screen size: 507 mm (20 inches) measured diagonally Actual screen size: 533.4 mm (21 inches) measured diagonally			
Speaker output	6 W x 2			
Dynamic Bass Response System	14 W			
Power consumption	145 W in use 1 W in standby			
Dimensions (W/H/D)	609 x 488 x 503 mm (24 x $19^{1}/_{4}$ x 20 inches)			
Mass	29 kg (63 lbs. 9.3 oz)			

Design and specifications are subject to change without notice.

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Sony Corporation Printed in U.S.A.

PRINTING THE SERVICE MANUAL

The PDF of this service manual is not designed to be printed from cover to cover. The pages vary in size, and must therefore be printed in sections based on page dimensions.

NON-SCHEMATIC PAGES

Data that does NOT INCLUDE schematic diagrams are formatted to 8.5 x 11 inches and can be printed on standard letter-size and/or A4-sized paper.

SCHEMATIC DIAGRAMS

The schematic diagram pages are provided in two ways, full size and tiled. The full-sized schematic diagrams are formatted on paper sizes between 8.5" x 11" and 18" x 30" depending upon each individual diagram size. Those diagrams that are LARGER than 11" x 17" in full-size mode have been tiled for your convience and can be printed on standard 11" x 17" (tabloid-size) paper, and reassembled.

TO PRINT FULL SIZE SCHEMATIC DIAGRAMS

If you have access to a large paper plotter or printer capable of outputting the full-sized diagrams, output as follows:

1) Note the page size(s) of the schematics you want to output as indicated in the middle window at the bottom of the viewing screen.

2) Go to the File menu and select Print Set-up. Choose the printer name and driver for your large format printer. Confirm that the printer settings are set to output the indicated page size or larger.

3) Close the Print Set Up screen and return to the File menu. Select "Print..." Input the page number of the schematic(s) you want to print in the print range window. Choose OK.

TO PRINT TILED VERSION OF SCHEMATICS

Schematic pages that are larger than 11" x 17" full-size are provided in a 11" x 17" printable tiled format near the end of the document. These can be printed to tabloid-sized paper and assembled to full-size for easy viewing.

If you have access to a printer capable of outputting the tabloid size (11" x 17") paper, then output the tiled version of the diagram as follows:

1) Note the page number(s) of the schematics you want to output as indicated in the middle window at the bottom of the viewing screen.

2) Go to the File menu and select Print Set-up. Choose the printer name and driver for your printer. Confirm that the plotter settings are set to output 11" x 17", or tabloid size paper in landscape (▭) mode.

3) Close the Print Set Up screen and return to the File menu. Select "Print..." Input the page number of the schematic(s) you want to print in the print range window. Choose OK.

TO PRINT SPECIFIC SECTIONS OF A SCHEMATIC

To print just a particular section of a PDF, rather than a full page, access the Graphics Select tool in the Acrobat Reader tool bar.

1) To view the Graphics Select Tool, press and HOLD the mouse button over the Text Select Tool which looks like:
This tool will expand to reveal to additional tools.
Choose the Graphics Select tool by placing the cursor over the button on of the far right that looks like:

2) After selecting the Graphics Select Tool, place your cursor in the document window and the cursor will change to a plus (+) symbol. Click and drag the cursor over the area you want to print. When you release the mouse button, a marquee (or dotted lined box) will be displayed outlining the area you selected.

3) With the marquee in place, go to the file menu and select the "Print..." option. When the print window appears, choose the option under the section called "Print Range" which says "Selected Graphic".

Select OK and the output will print only the area that you outlined with the marquee.

(continued >)

ON-SCREEN SEARCH OPTION

All of the text within the service manual PDF is content searchable. This means that you can enter any text, word, phrase or reference number that appears in the manual, and the PDF software will search, find and move the cursor to the location where you requested text first appears. This feature can be particularly useful in locating components on a specific schematic or printed wire circuit board (PWB) diagrams.

Follow these steps to effectively locate a component on a schematic diagram:

1) Locate the schematic you want to search by clicking on the corresponding bookmark on the left side of the screen. The view on the right of the screen will then jump to the desired schematic page.

2) Magnify the diagram to at least 400% before conducting a component search. This will enable you to easily view the reference number when it is highlighted on screen. To do this, click on the magnifying glass button on the tool bar at the top of the screen. Move the cursor over the diagram and RIGHT click you mouse. Select the 400% magnification option on the pop-up menu. Click on the button with the icon of the open hand to deactivate the magnification tool

3) Search the diagram (or the entire manual) by clicking on the binocular button tool at the top of the screen. The “Find” window will appear and allow you to type in your desired text. Type in a reference designator, such as R502, and click on the “Find” button. If the component is not on the diagram, but is listed anywhere else in the manual, the cursor will jump to the first location the text is found in the file. To find another instance of that same text, click on the binocular button again and select “Find Again.”

SERVICE MANUAL

BA-6 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
KV-21FA210	RM-Y180	LATIN NORTH	SCC-S60P-A
KV-21FA210	RM-Y180	LATIN SOUTH	SCC-S60Q-A

CORRECTION- 1

SUBJECT: REPLACED A BOARD TRANSISTOR VOLTAGE LIST (Q600, Q601)
REPLACED A BOARD IC VOLTAGE LIST (IC600)

Correct the service manual as shown.
File this Correction with the service manual.

☛ : Corrected Items

SECTION 5: DIAGRAMS

5-3. BLOCK DIAGRAM AND SCHEMATICS

A Board Transistor Voltage List (Page 34)

A Board IC Voltage List (Page 35)

TRINITRON® COLOR TELEVISION

SONY®

9-965-938-91

SECTION 5: DIAGRAMS

5-3. BLOCK DIAGRAM AND SCHEMATICS (Page 34)

A BOARD TRANSISTOR VOLTAGE LIST

	B	C	E		B	C	E
Q002	0.0	2.0	GND	**Q405**	0.0	0.0	GND
Q004	3.8	9.0	4.4	**Q411**	0.0	5.8	GND
Q005	5.1	0.8	5.0	**Q412**	0.1	0.1	GND
Q006	0.0	0.0	GND	**Q435**	0.0	GND	5.8
Q008	0.0	2.6	GND	**Q501**	0.0	14.3	GND
Q009	0.0	5.2	GND	**Q502**	0.0	74.1	GND
Q301	3.6	2.1	3.6	**Q506**	0.0	131.8	0.0
Q303	3.6	GND	2.8	**Q521**	0.0	3.8	GND
Q304	3.6	GND	2.9	**Q522**	0.1	-2.1	0.0
Q305	3.6	GND	3.0	**Q572**	0.0	2.6	GND
Q306	5.5	GND	4.9	**Q573**	2.6	0.0	2.6
Q390	0.8	1.5	1.9	**Q578**	0.0	0.5	GND
Q391	0.6	3.3	1.5	**Q590**	133.7	0.0	134.2
Q400	0.0	0.1	GND	**Q604**	30.6	11.6	30.2
Q401	0.0	0.1	GND	**Q608**	0.0	6.7	GND
Q404	0.0	0.0	GND	**Q650**	5.8	9.0	5.0

All voltages are in V.

	D	G	S
Q600	340.0	160.0	156.0
Q601	155.0	4.9	0.0

SECTION 5: DIAGRAMS

5-3. BLOCK DIAGRAM AND SCHEMATICS (Page 35)

A BOARD IC VOLTAGE LIST

IC001		44	1.6	7	GND	3	-12.2	13	NC
PIN	VOLT	45	1.6	8	5.0	4	-13.3	14	163.9
1	N/C	46	2.3	IC003		5	0.2	15	153.8
2	GND	47	1.0	PIN	VOLT	6	13.8	16	158.2
3	2.2	48	N/C	1	N/C	7	0.7	17	NC
4	2.2	49	0.5	2	GND	IC561		18	340.0
5	GND	50	1.2	3	GND	PIN	VOLT	IC603	
6	5.0	51	2.0	4	5.0	1	0.1	PIN	VOLT
7	0.0	52	1.5	5	5.0	2	3.4	I	12.0
8	2.0	53	4.8	IC401		3	2.3	G	GND
9	0.3	54	4.8	PIN	VOLT	4	GND	O	9.0
10	2.1	55	4.8	1	4.5	5	9.2	IC604	
11	5.0	56	4.8	2	0.3	6	10.2	PIN	VOLT
12	GND	57	N/C	3	4.5	7	0.1	1	133.7
13	3.3	58	5.2	4	0.3	8	13.5	2	N/C
14	3.1	59	0.0	5	4.5	IC565		3	2.5
15	1.0	60	0.0	6	4.5	PIN	VOLT	4	11.3
16	1.5	61	0.0	7	0.0	1	3.4	5	GND
17	3.3	62	0.0	8	4.5	2	3.4	IC608	
18	0.5	63	1.4	9	4.5	3	2.1	PIN	VOLT
19	1.1	64	4.9	10	N/C	4	9.0	I	11.0
20	GND	65	4.9	11	4.4	5	1.0	O	5.0
21	0.5	66	0.0	12	0.0	6	1.0	G	GND
22	1.7	67	0.1	13	4.5	7	1.0	IC633	
23	0.5	68	0.1	14	9.0	8	1.6	PIN	VOLT
24	0.5	69	2.4	15	4.4	9	1.6	I	9.0
25	0.5	70	5.0	16	GND	10	1.6	G	GND
26	0.0	71	5.0	IC404		11	GND	O	3.3
27	0.0	72	0.1	PIN	VOLT	12	1.6		
28	2.1	73	0.0	1	14.6	13	1.6		
29	2.7	74	5.0	2	7.0	14	1.6		
30	3.3	75	5.0	3	GND	IC600			
31	2.9	76	5.0	4	7.0	PIN	VOLT		
32	GND	77	0.1	5	5.9	1	2.8		
33	2.8	78	0.0	6	0.0	2	1.9		
34	3.3	79	4.9	7	GND	3	2.3		
35	2.9	80	4.9	8	0.0	4	2.6		
36	GND	IC002		9	0.5	5	GND		
37	1.8	PIN	VOLT	10	7.2	6	0.0		
38	0.0	1	GND	11	GND	7	4.6		
39	0.1	2	GND	12	7.0	8	17.5		
40	2.0	3	GND	IC545		9	0.0		
41	1.6	4	GND	PIN	VOLT	10	10.6		
42	3.3	5	4.8	1	0.7	11	0.0		
43	N/C	6	4.8	2	13.5	12	4.9		

All voltages are in V.

Sony Corporation
Sony Technology Center
Technical Services
Service Promotion Department

English
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